KEY

TO

ADVANCED ARITHMETIC

CALIFORNIA STATE SERIES

THE BANCROFT COMPANY

SAN FRANCISCO

Sample Book

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THE HICKS-JUDD CO.

23 FIRST STREET

SAN FRANCISCO

KEY

TO THE

ADVANCED ARITHMETIC

(California State Series)

Containing full solutions to all of the Examples

WITH AN

APPENDIX

Containing the answers to Fifteen Hundred Examples in the

PRIMARY NUMBER LESSONS

PREPARED BY

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SAN FRANCISCO
THE BANCROFT COMPANY
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PREFACE

Generally speaking, rules are omitted from the State Series of Arithmetics, and consequently a demand for a guiding "KEY" has arisen. This book is published to supply that want.

The author does not claim that his methods are in all cases the shortest and the best. With few exceptions, they are the ones naturally followed by his students, and it is his belief that as a rule they represent the solutions that will be used by the average pupil that has been taught "to look for a reason for everything."

The book is open to criticism, and correspondence is invited in order that succeeding editions may contain such alterations as will make the Key truly representative of the arithmetical work of California teachers.

A. M. A.

Colusa, Cal., June 1888.

KEY

TO

CALIFORNIA ADVANCED ARITHMETIC

PART I.

INTEGRAL NUMBERS

PRACTICAL ADDITION AND SUBTRACTION

47. Page 28.

1 4750 − 1287 = 3463 A.

2 156 + 273 + 195 + 390 + 312 = 1326 trees

3 83 + 147 = $230

4 263 − 197 = 66 miles

5 31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30 + 31 + 30 + 31 = 365 d'ys

6 2500 + 350 + 65 + 119 + 47 = $3081

7 21,420 − 16,283 = 5137 people

8 1885 − 1822 = 63 years

9 3047 − 2816 = 231 miles Mo.

10 4617 + 3943 + 3248 + 24,257 + 3308 = 39,373 votes

11 $4617+3943+3248+3308=15{,}116$; $24{,}257-15{,}116=9141$

12 $187+298=\$485$ drew; $2375-485=\$1890$ rem.

13 $16{,}120+75{,}025=91{,}145$ both; $75{,}025-16{,}120=58{,}905$ Chinese

14 $187+153=340$; $425-340=85$ trees

15 $212-185=\$27$

16 $1799-1732=67$; $1865-1809=56$; $67-56=11$ years, Wash.

17 $1276+125=1401$; $1276+1401+375=3052$; $1276+1401+3052=5729$ Cen. All

18 $1852-70=1782$

19 $1483+578+230+1020=3311$

20 $145+65=\$210$

21 Present year $-1850=$ *Ans.*

22 $309+576=885$ sum; $576-309=267$ Diff; $885-267=618$

23 $2375+450=\$2825$; $3100-2825=\$275$ gain

24 $602+1312+490=2404$ to Chicago; $2404+963=3367$ to N.Y.

25 $602+1312=1914$; $490+963=1453$. $1914-1453=461$ miles

26 Present year $-1492=$ *Ans.*

27 $89{,}225+102{,}406+2960+2010+356=196{,}957$ votes

28 $102{,}406-89{,}225=13{,}181$ votes

29 $89{,}225+2{,}960+2010+356=94{,}551$; $102{,}406-94{,}551=7855$

30 $17+26+8+18+11+7=\$87$; $\$100-\$87=\$13$ change

31 $173+49=222$

32 $1208-749=459$

33 $970-127=843$

34 $800+925+1175=\$2900$; $\$4000-\$2900=\$1100$

35 $100-23=77$

36 $1728-209=1519$

37 Present Year − 69 = *Ans.*

38 1922 − birth year = *Ans.*

39 2500 + 1550 + 1325 + 725 = $6100

40 57 + 73 + 61 + 93 + 84 + 101 + 112 = 581 pupils

41 581 − 273 = 308 girls

42 1706 + 84 = 1790 A. D.

43 50,267,519 − 38,567,617 = 11,699,902 gain

44 6608 + 11,591 = 18,199 mi.; 11,591 − 6608 = 4983 miles more

45 31 + 28 + 31 + 30 + 31 + 30 = 181 days

46 145 + 25 = 170 cts.; 145 − 25 = 120 cts.; 170 − 120 = 50 cts.

47 2783 − 1296 = $1487

48 125 + 125 + 125 = $375; $375 − $171 = $204 saved

49 370 + 370 + 370 + 370 = $1480 saved

50 1250 + 498 + 726 = 2474 cen.; 550 + 1500 = 2050 cen sold; 2474 − 2050 = 424 cen. rem.

51 753 + present year = *Ans.*

52 4004 − 1652 = 2352 B. C.

53 29,062 − 14900 = 14162 feet

54 175 + 213 + 94 = 482 miles

55 190 − 45 = $145 cost

56 125 + 256 + 114 = $495 spent; 1000 − 495 = $505 left

57 130 + 115 + 58 = 303 sheep; 325 + 345 + 203 = $873

58 2375 + 250 = $2625; 2625 − 175 = $2450

59 $3400 + 1700 + 1700 + 1500 + 1500 + 1500 = $11300

60 2114 − 906 = 1208 drunks

61 31 + 30 + 31 + 30 + 31 = 153 days

62 1571 − 753 = 818 years

63 $2700 - $725 = $1975

64 30+31+31+30=122 days; 31+28+31+30 = 120 days; 122 - 120 = 2 days

65 1769+79=1848 A. D.

66 29,062+1317=30379 feet

67 175 - 30=145 cts.; 145 - 30=115 cts.

68 32+32+32+32=128 trees; 128 - 72=66 lemon trees

65 Page 41

1 25 × $37 = $925

2 32 × 24 hrs. = 768 hrs.

3 11 × $16 = $176

4 18 × 5280 ft. = 95,040 ft.

5 24 × 23 miles = 552 miles

6 93 × 104 trees = 9672 trees

7 35 × $33,275 = $1,164,625

8 960 × $75 = $72,000

9 346 × 65 lbs. = 22,490 lbs.

10 12 × $75 = $900

11 24 × $23 = $552

12 26 × 19 = $494

13 12 × $525 = $6300

81 Page 54

1 925 ÷ 37 = 25 cows

2 744 ÷ 24 = 31 days

3 176 ÷ 10 = 11 months

4 552 ÷ 23 = 24 hrs.

5 9672 ÷ 104 = 93 acres

6 1,164,625 ÷ 33,275 = 35 mi.

7 72,000 ÷ 75 = 960 acres

8 22,490 ÷ 65 = 346 chests

9 900 ÷ 75 = 12 months

10 605 ÷ 55 = 11 ponies

PRACTICAL MULTIPLICATION AND DIVISION

82 Page

1 50×45 yds. $= 2250$ yds.

2 $1728 \div 8 = 216$ T.

3 $190 \times \$112 = \$21{,}280$

4 $15 \times 320 = 4800$ rods

5 $11 \times \$31 = \$341$ cost

6 $1500 \div 14 = 107$ T., \$2 rem.

7 $15 \times 235 = 3525$ lbs.

8 $19{,}600 \div 240 = 81$, 160 rem.

9 $8700 \div 600 = 14\frac{300}{600}$ bags

10 $5 \times 360 = 1800$ eggs

11 $9785 \div 24 = 407$, 17 rem.

12 $365 \times 24 = 8760$ hrs.

13 $850 \times 28 = \$23{,}800$

14 $1974 \div 14 = 141$ calves

15 $8 \times 3 = 24$; $72 \div 24 = 3$ miles

16 $11 \times 175 = \$1925$ saved

17 $132{,}890 \times \$95 = \$12{,}624{,}550$ total value

18 $1{,}246{,}453 \div 137 = 9098$, 27 rem.

19 $3672 \div 297 = 12$, 108 rem.

20 $365 \times 25 = 9125$ cts. cost

21 $\$512 \div 64 = \$8$; $25 \times \$8 = \$200$

22 4 wks $\times 7 = 28$ days; $28 \times 15 = 420$ cts; $420 \div 10 = 42$ loaves

23 $15 \times 25 = \$375$; $11 \times 95 = \$1045$; $50 \times 3 = \$150$; $\$375 + 1045 + 150 = \$1570$

24 $1575 \div 15 = \$105$; $2750 \div 25 = \$110$; $110 - 105 = \$5$ latter

25 $\$295 + 1275 + 96 + 12 + 115 + 60 = \$1853$; $\$2000 - \$1853 = \$147$ cost of pasture; $\$147 \div 3 = \$49$ per acre

26 130 cts. $+ 35 + 80 + 75 + 40 = 360$ cts; 360 cts. $\div 8 = 45$ cts. per roll

27 $1275 \div 15 = 85$ cts. cost; $15 \times 10 = 150$ cts. gain; 1275 cts. + 150 cts. = 1425 cts., received

28 $5 \times 20 = \$100$; $\$100 - 95 = \$5$ change

29 50 cts. $+ 300 + 50 = 400$ cts.

30 $2 \times 37 + 13 = 87$ left; $87 + 37 = 124$ oranges

31 $3675 \div 21 = 175$ bbls.

32 175×265 lbs. $= 46{,}375$ lbs.

33 $4032 \div 14 = 288$ mi. a day; $288 \div 24 = 12$ miles an hour

34 $35 \times 41 = 1435$ yds.

35 $175 \times \$24 = \$4200$ cost; $4200 - 3500 = \$700$ due

36 $4 \times 7 \times \$3 = \$84$ amount

37 $4000 - 3879 = 121, \times 121 = 14{,}641, + 1781 = 16{,}422, \div 23 = 741$ quotient

38 $28 - 23 = 5$ mi.; 13×5 mi. $= 65$ mi.

39 $20 + 29 = 49$ mi. in one day; $49 \times 11 = 539$mi.; $600 - 539 =$ 61 mi.

40 $1887 - 1790 = 97$ yrs.; $97 \div 10 = 9$ since, + first $= 10$.

41 $1887 - 1789 = 98$ yrs.; $98 \div 4 = 24$; $24 + 1 = 25$

42 $\$159{,}175 \div 5 = \$31{,}835$ average

43 4 yrs. $\times$ 365 days $= 1460$ days; $1460 \times 45 = 65{,}700$ cts.; $65{,}700 \div 50 = 1314$ days

44 $259{,}186 \div 312 = 830$ bales, 226 rem.

45 $6 \times 24 \times 22$ mi. $= 3168$ mi.; $7 \times 24 \times 16$ mi. $= 2688$ mi., $3168 - 2688 = 480$ mi. train

46 $137 \times \$13 = \$1781$

47 $160 \times 2 \times \$11 = \$3520$; $160 \times 16 \times \$1 = \$2560$; $\$3520 + \$2560 = \$6080$ sum; $\$3520 - \$2560 = \$960$ Diff.

48 $8 \times 240 \div 32 = 60$ days

49 $2750 \div 50 = 55$ sacks

50 $10 \times \$125 \div \$10 = 125$ cd.

51 $11{,}984 \div 107 = 112$ trees

52 $12 \times 12 = 144$ days

53 $375 \div 1 = 375$ boxes

54 $84 \times 750 = 63{,}000$ oranges; $63{,}000 \div 12 = 5250$ doz.

55 5250×12 cts. $= 63{,}000$ cts.

56 $12 \times 16 \div 6 = 32$ days

57 $125 \times \$6 = \$750$; $25 \times \$4 = \$100$; $\$750 + \$100 - \$750 = \$100$ gain

58 $1000 \div 65 = 15$, \$25 rem; $25 \div 5 = 5$ rings

59 $\$120 - \$60 = \$65$ saved in one mo.; $1920 \div 60 = 32$ mo.

60 $\$22 + \$42 = \$64$; $12 \times 64 = \$768$ one year's expenses; $\$1500 - \$768 = \$732, \times 4 = \$2928$ saved

61 $24 \times \$2 = \$48 + \$175 = \$223$ cost; $\$225 - \$223 = \$2$ gain

62 $70 - 21 = 49$ yrs.; $49 \times 12 \times \$15 = \$8820$

63 $\$50{,}000 \div 12 = \$4166\frac{8}{12}$; $50{,}000 \times 4 = \$200{,}000$

64 $1974 \div 141 = \$14$

65 $450 \div 150 = \$3$ gain on each; $\$14 + \$3 = \$17$ S. P. per head

66 $\$85 + 95 + 105 + 115 + 120 = \$520$; $\$520 \div 5 = \$104$ average value

67 $365 \times \$3 = \$1095$; $\$1750 - \$1095 = \$655$ saved

68 $\$1955 \div 23 = \$85$ cost of one A; $33 \times \$85 = \$2805$ total cost

69 $\$20 - \$2 = \$18$; $\$432 \div \$18 = 24$ watches

70 $200 + 375 = 575$; $784 - 575 = 209$ rem.; $209 \times \$2 = \$418$

71 320 − (160 + 80) = 80 A.; 160 × $125 = $20,000; 80 × $75 = $6000
30,000 − (20,000 + 6000) = $4000, ÷ 80 = $50 per acre

72 31 × $3 = $93; $80 + $15 = $95; $95 − $93 = $2 change

73 15 × 38 × $4 = $2280

74 $195 + 210 + 255 + 300 = $960; 960 ÷ 4 = $240 average value

75 63 × 231 = 14,553 cu. in.

76 11 + 4 − 8 = 7 tons; 7 × $45 = $315

77 $2160 ÷ 12 = $180 S. P. each

78 $105 ÷ 35 = $3 for one yard; 25 × $3 = $75

79 32 + 42 = 74 yds.; $296 ÷ 74 = $4 average per yard

80 94 + 2 = 96; 96 ÷ 4 = 24 marbles

81 4 × 7 = 28da., × 15 ÷ 60 × 10 cts = 70 cts.

82 1755 ÷ 39 = 45 yrs.

83 135 × 25 ÷ 15 = 225 lbs.

84 4 × 65 = 260 scholars; 260 − 105 = 155 girls

85 105 × 2 = 210 rds.; 108 × 2 = 216 rds.; 210 + 216 = 426 rds.

86 148 × 2 = 296 steps

87 11 × 15 ÷ 5 = 33 days

88 $1665 − $1530 = $135, $135 ÷ 9 = $15 gain on each

GREATEST COMMON DIVISOR

86 Page 66

1
24 = 2, 2, 2, 3
36 = 2, 2, 3, 3
42 = 2, 3, 7
2 × 3 = 6 G. C. D.

2
33 = 3, 11
44 = 2, 2, 11
77 = 7, 11
187 = 11, 17
11 G. C. D.

3 $120 = 2, 2, 2, 3, 5$
$144 = 2, 2, 2, 2, 3, 3$
$216 = 2, 2, 2, 3, 3, 3$
$2 \times 2 \times 2 \times 3 = 24$ G. C. D.

4 $135 = 3, 3, 3, 5$
$180 = 2, 2, 3, 3, 5$
$90 = 3, 3, 2, 5$
$3 \times 3 \times 5 = 45$ G. C. D.

5 $108 = 2, 2, 3, 3, 3$
$45 = 3, 3, 5$
$81 = 3, 3, 3, 3$
$3 \times 3 = 9$ G. C. D.

6 $85 = 5, 17$
$95 = 5, 19$
5 G. C. D.

7 $72 = 2, 2, 2, 3, 3$
$168 = 2, 2, 2, 3, 7$
$2 \times 2 \times 2 \times 3 = 24$ G. C. D.

8 $119 = 7, 7$
$132 = 2. 2, 3, 1$
No C. D.

9 $24 = 2, 2, 2, 3$
$33 = 3, 11$
$120 = 2, 2, 2, 3, 5$
3 G. C. D.

10 $36 = 2, 2, 3, 3$
$44 = 2, 2, 11$
$144 = 2, 2, 2, 2, 3, 3$
$2 \times 2 = 4$ G. C. D.

11 $105 = 3, 5, 7$
$120 = 2, 2, 2, 3, 5$
$135 = 3, 3, 3, 5$
$3 \times 5 = 15$ G. C. D.

12 $144 = 2, 2, 2, 2, 3, 3$
$180 = 2, 2, 3, 3, 5$
$2 \times 2 \times 3 \times 3 = 36$ G. C. D.

13 $105 = 3, 5, 7$
$140 = 2, 2, 5, 7$
$175 = 5, 5, 7$
$5 \times 7 = 35$ G. C. D.

14 $99 = 3, 3, 11$
$180 = 2, 2, 3, 3, 5$
$252 = 3, 3, 2, 2, 7$
$3 \times 3 = 9$ G. C. D.

15 $132 = 2, 2, 3, 11$
$154 = 2, 7, 11$
$165 = 3, 5, 11$
11 G. C. D.

16 $60 = 10, 2, 3$
$80 = 10, 2, 2, 2$
$100 = 10, 2, 5$
$120 = 10, 2, 2, 3$
$10 \times 2 = 20$ G. C. D.

17 $864 = 2, 2, 2, 2, 2, 3, 3, 3$
$420 = 2, 2, 3, 5, 7$
$600 = 2, 2, 2, 3, 5, 5$
$2 \times 2 \times 3 = 12$ G. C. D.

18 $75 = 3, 5, 5$
$105 = 3, 5, 7$
$120 = 2, 2, 2, 3, 5$
$3 \times 5 = 15$ G. C. D.

19 $108 = 2, 2, 3, 3, 3$
$252 = 2, 2, 3, 3, 7$
$2 \times 2 \times 3 \times 3 = 36$ G. C. D.

20 $39 = 3, 13$
$52 = 2, 2, 13$
$65 = 5, 13$
13 G. C. D.

21 $84 = 2, 2, 3, 7$
$132 = 2, 2, 3, 11$
$2 \times 2 \times 3 = 12$ G. C. D.

22 $168 = 2, 2, 2, 3, 7$
$539 = 7, 7, 11$
7 G. C. D.

23 $112 = 2, 2, 2, 2, 7$
$147 = 3, 7, 7$
$168 = 2, 2, 2, 3, 7$
7 G. C. D.

24 $287 = 7, 41$
$369 = 3, 3, 41$
41 G. C. D.

25 $55 = 5, 11$
$110 = 2, 5, 11$
$5 \times 11 = 55$ G. C. D

26 $81 = 3, 3, 3, 3$
$120 = 2, 2, 2, 3, 5$
$141 = 3, 47$
3 G. C. D.

27 $78 = 2, 3, 13$
$169 = 13, 13$
$130 = 2, 5, 13$
13 G. C. D.

28 $150 = 10, 3, 5$
$210 = 10, 3, 7$
$330 = 10, 3, 11$
$10 \times 3 = 30$ G. C. D.

29 $99 = 3, 3, 11$
$132 = 2, 2, 3, 11$
$3 \times 11 = 33$ G. C. D.

30 $120 = 2, 2, 2, 3, 5$
$165 = 3, 5, 11$
$3 \times 5 = 15$ G. C. D.

31 $120 = 2, 2, 2, 3, 5$
$252 = 2, 2, 3, 3, 7$
$2 \times 2 \times 3 = 12$ G. C. D.

32 $85 = 5, 17$
$102 = 2, 3, 17$
17 G. C. D

33 42=2, 3, 7
77=7, 11,
91=7, 13
7 G. C. D.

34 34=2, 17
44=2, 2, 11
2 G. C. D.

35 28=2, 2, 7
98=2, 7, 7
2×7=14 G. C. D.

36 110=10, 11
210=10, 3, 7
10 G. C. D.

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1 135=3, 3, 3, 5
270=2, 3, 3, 3, 5
3×3×3×5=135G. C. D.

2 207=3, 3, 23
1017=3, 3, 113
3×3=9 G. C. D.

3 702=2, 3, 3, 3, 13
4706=2, 13, 181
2×13=26 G. C. D.

4 3003= 3, 7, 11, 13
11,011=11, 7, 11, 13
7×11×13=1001 G. C. D.

5 725=5, 5, 29
4350=2, 3, 5, 5, 29
5×5×29=725 G. C. D.

6 87=3, 29
203=7, 29
29 G. C. D.

7 750=2, 3, 5, 5, 5
129=3, 43
3 G. C. D.

8 597=3, 199
237=3, 79
3 G. C. D.

9 975=3, 5, 5, 13
555=3, 5, 37
3×5=15 G. C. D.

10 510=2, 3, 5, 17
714=2, 3, 7, 17
2×3×17=102 G. C. D.

11 378=2, 3, 3, 3, 7
1818=2, 3, 3, 101
2×3×3=18 G. C. D.

12 1011=3, 337
1101=3, 367
3 G. C. D.

13 246=2, 3, 41
438=2, 3, 73

2×3=6 G. C. D.

14 720=2, 2, 2, 2, 3, 3, 5
256=2, 2, 2, 2, 2, 2, 2, 2

2×2×2×2=16 G. C. D.

15 981=3, 3, 109
711=3, 3, 79

3×3=9 G. C. D.

16 846=2, 3, 3, 47
329=7, 47

47 G. C. D.

17 279=3, 3, 31
496=2, 2, 2, 2, 31

31 G. C. D.

18 213=3, 71
284=2, 2, 71

71 G. C. D

135=3, 3, 3, 5
270=2, 3, 3, 3, 5
207=3, 3, 23
1017=3, 3, 113

3×3=9 G. C. D.

b 702= 2, 3, 3, 3, 13
4706= 2, 13, 181
3003= 3, 7, 11, 13
11011=11, 7, 11, 13

13 G. C. D

c 725=5, 5, 29
4350=2, 3, 5, 5, 29
87=3, 29
203=7, 29

29 G. C. D.

d 750=3, 2, 5, 5, 5
129=3, 43
597=3, 199
237=3, 79

3 G. C. D.

e 975=3, 5, 5, 13
555=3, 5, 37
510=2, 3, 5, 17
714=2, 3, 7, 17

3 G C. D

f 378=2, 3, 3, 3, 7
1818=2, 3, 3, 101
1011=3, 337
1101=3, 367

3 G. C. D

g $246 = 2, 3, 4$
$438 = 2, 3, 73$
$720 = 2, 2, 2, 2, 3, 3, 5$
$256 = 2, 2, 2, 2, 2, 2, 2, 2$

2 G. C. D.

h $981 = 3, 3, 109$
$711 = 3, 3, 79$
$846 = 2, 3, 3, 47$
$329 = 7, 47$

No C. D.

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1
539(168
504 (3
168(35
140 (4
35(28
28 (1
28 (7 G.C. D.
28 (4

2
168(147
147 (1
147(21 G.C.D
147 (7

3
369(287
287 (1
287(82
246 (3
82(41 G. C. D.
82 (2

4
169(78
156 (2
78(13 G.C.D.
78 (6

5
636(371
371 (1
371(265
265 (1
265(106
212 (2
106(53 G. C. D.
106 (2

6
961(279
837 (3
279(124
248 (2
124(31 G. C. D.
124 (4

LEAST COMMON MULTIPLE

90 Page 68

1

5	30	45 90
3	6	9 18
3	2	3 6
2	2	2

$= 90$

2

2×3	24	36 42
2	4	6 7
	2	3 7

$= 504$

3

2	4	8 10 5
2	2	4 5 5
5		2 5 5
	2	

$= 40$

4

5	5	12 15 30
3		12 3 6
2		4 2
	2	

$= 60$

5

2	7	12 18 24
3	7	6 9 12
2	7	2 3 4
	7	3 2

$= 504$

6

5×5	75	100
	3	4

$= 300$

7

2×5	20	30 40
2	2	3 4
	3	2

$= 120$

8

11	33	44 21
	3	4 7

$= 924$

9

5	105	120
3	21	24
	7	8

$= 840$

10

3	18	27 12
3	6	9 4
2	2	3 4
		3 2

$= 108$

11

7	14	21 15
3	2	3 15
	2	5

$= 210$

12

3	3	4 5 6 10
2		4 5 2 10
5		2 5 5
		2

$= 60$

13

2×3	12	18 24 36 72
2	2	3 4 6 12
3		3 2 3 6
2		2 2

$= 72$

14

2×2	12	16 20 24
3	3	4 5 6
2		4 5 2
		2 5

$= 240$

15
$$\begin{array}{r|lll} 7 & 28 & 2 & 35 \\ 2 & 4 & 6 & 5 \\ \hline & 2 & 3 & 5 \end{array} = 420$$

16
$$\begin{array}{r|lll} 5\times5 & 50 & 75 & 125 \\ \hline & 2 & 3 & 5 \end{array} = 750$$

17
$$\begin{array}{r|lll} 2 & 9 & 10 & 12 \\ 3 & 9 & 5 & 6 \\ \hline & 3 & 5 & 2 \end{array} = 180$$

18
$$\begin{array}{r|llll} 3 & 24 & 30 & 36 & 40 \\ 2 & 8 & 10 & 12 & 40 \\ 2 & 4 & 5 & 6 & 20 \\ 2 & 2 & 5 & 3 & 10 \\ 5 & & 5 & 3 & 5 \\ \hline & & & 3 & \end{array} = 360$$

19
$$\begin{array}{r|lll} 2, 2, 3 & 108 & 132 & 144 \\ 3 & 9 & 1 & 12 \\ \hline & 3 & 11 & 4 \end{array} = 4752$$

20
$$\begin{array}{r|lll} 7 & 7 & 11 & 14 & 21 \\ \hline & 11 & 2 & 3 \end{array} = 462$$

21
$$\begin{array}{r|lll} 2, 2, 3 & 72 & 84 & 132 \\ \hline & 6 & 7 & 11 \end{array} = 5544$$

22
$$\begin{array}{r|lll} 3 & 75 & 105 & 120 \\ 5 & 25 & 35 & 40 \\ \hline & 5 & 7 & 8 \end{array} = 4200$$

23
$$\begin{array}{r|lll} 2 & 30 & 42 & 126 \\ 3 & 15 & 21 & 63 \\ 7 & 5 & 7 & 21 \\ \hline & 5 & & 3 \end{array} = 630$$

24
$$\begin{array}{r|lll} 2, 5 & 120 & 140 & 210 \\ 7 & 12 & 14 & 21 \\ 2 & 12 & 2 & 3 \\ 3 & 6 & & 3 \\ \hline & 2 & & \end{array} = 840$$

25
$$\begin{array}{r|lll} 5 & 15 & 21 & 35 \\ 3 & 3 & 21 & 7 \\ 7 & & 7 & 7 \\ \hline & & & \end{array} = 105$$

26
$$\begin{array}{r|lll} 19 & 38 & 57 & 95 \\ \hline & 2 & 3 & 5 \end{array} = 570$$

27
$$\begin{array}{r|lll} 3, 3 & 18 & 27 & 36 \\ 2 & 2 & 3 & 4 \\ \hline & & 3 & 2 \end{array} = 108$$

28
$$\begin{array}{r|lll} 13 & 26 & 39 & 65 \\ \hline & 2 & 3 & 5 \end{array} = 390$$

29
$$\begin{array}{r|lll} 11 & 33 & 44 & 55 \\ \hline & 3 & 4 & 5 \end{array} = 660$$

30
$$\begin{array}{r|ll} 12 & 84 & 96 \\ \hline & 7 & 8 \end{array} = 672$$

31 12 13 = 156

32 13 16 = 208

33
$$\begin{array}{r|lll} 5 & 23 & 25 & 30 \\ \hline & 23 & 5 & 6 \end{array} = 3450$$

34 $9 \cdot 11 = 99$

35 $2 \mid 24 \quad 26$
$12 \quad 13 = 312$

36 $24 \cdot 25 = 600$

37 $2.2 \mid 64 \quad 84$
$16 \quad 21 = 1344$

38 $2 \mid 34 \quad 36$
$17 \quad 18 = 612$

39 $2.3 \mid 17 \quad 18 \quad 30$
$17 \quad 3 \quad 5 = 1530$

92 Page 69

1 $189(105 \quad 21)105$
$105(1 \qquad 5 \times 189 = 945$
$84 = 2, 2, 21$

2 $169(91 \quad 13)91$
$91(1 \qquad 7 \times 169 = 1183$
$78 = 2, 3, 13$

3 $169(78 \quad 13)78$
$156(2 \qquad 6 \times 169 = 1014$
13

4 $132 \times 119 = 15708$

5 $539(168 \quad 7)168$
$504(3 \qquad 24 \times 539 =$
$35 = 5 \times 7 \qquad 12936$

6 $369(287 \quad 41)287$
$287(1 \qquad 7 \times 369 =$
$82 = 2 \times 41 \qquad 2583$

7 $168(147 \quad 21)147$
$147(1 \qquad 7 \times 168 =$
$21 \qquad 1176$

8 $279(124 \quad 31)124$
$248(2 \qquad 4 \times 279 = 1116$
31

9 $21(15 \quad 3)15$
$15(1 \qquad 5 \times 21 = 105$
$6 = 2, 3$

10 $28(21 \quad 7)21$
$21(2 \qquad 3 \times 28 = 84$
7

11 $20(16 \quad 4)16$
$16(1 \qquad 4 \times 20 = 80$
4

12 $45(40 \quad 5)40$
$40(1 \qquad 8 \times 45 = 360$
5

13 $45(36 \quad 9)36$
$36(1 \qquad 4 \times 45 =$
$9 \qquad 180$

14 $54(36 \quad 18)36$
$36(1 \qquad 2 \times 54 =$
$18 \qquad 108$

15 32 16=32

16 81(63 9)63
63 (1 7×81=567
18=2, 9

17 64(56 8)56
56 (1 7×64=448
8

18 44(33 11)33
33 (1 3×44=132
11

19 1017(207 9)207
828 (4 23×1017=
189=3, 3, 3, 7 23391

20 11011(3003
9009 (3
2002=2, 1001
1001)3003
3×11011=33033

21 203(81 29)87
174 (2 3×203=609
29

22 750(129 3)129
645 (5 43×750=
105=3, 3, 3, 5 32250

23 1818(378 18)378
1512 (4 21×1818=
306=3, 3, 2, 17 38178

24 981(711 9)711
711 (1 79×981=
270=10, 3, 3, 3 77499

25 846(329 47)329
658 (2 7×846=
188=2, 2, 47 5922

PRACTICAL FACTORING.

94 Page 70

1 15=3, 5
18=3, 3, 2
3 G. C. D.

2 120=2, 2, 2, 3, 5
128=2, 2, 2, 2, 2, 2, 2
144=2, 2, 2, 2, 3, 3
2, 2, 2=8 ft.

3 3, 4, 5=60 miles.

4 360=5, 2, 3, 3, 4
480=5, 2, 3, 4, 4
5, 2, 3, 4=120 ft.
360+480=840÷120=7 l.

5 5 | 20 15
4 3=60 min.
60÷15=4×80 rds.=320 rds.
60÷20=3×80 rds.=240 rds.

6 2 | 4, 6, 8, 10
2 | 2, 3, 4, 5
3, 2, 5 = 120 qts.

7 525 = 5, 7, 3, 5
945 = 5, 7, 3, 3, 3
5, 7, 3 = 105 lbs.
525 ÷ 105 = 5 bags × $2 = $10 barley.
945 ÷ 105 = 9 bags × $2 = $18 wheat.

8 2 | 5, 6, 7, 8, 10
5 | 5, 3, 7, 4, 5
3, 7, 4 = 840 cts.

9 5 | 2, 3, 5, 10
2 | 2, 3, 2
3 = 30 cts. × 4 = 120 cts.

10 112 = 2, 2, 2, 2, 7
140 = 2, 2, 5, 7
2, 2, 7 = 28 each.

11 3 | 7 9 12
7 3 4 = 252 nuts

12 3 | 3 4 5 6
2 | 4 5 2
2 5 = 60 in each
60 × 4 = 240 marbles

13 2 | 8 10 12
2 | 4 5 6
2 5 3 = 120 yds.

14 2 | 12 14 16
2 | 6 7 8
3 7 4 = 336 ÷ 4 = 340

15 47 − 2 = 45, = 3, 3, 5
77 − 2 = 75, = 3, 5, 5
3, 5 = 15

16 3 | 3 12 30 75
5 | 4 10 25
2 | 4 2 5
2 5 = $300 for each
$300 × 4 = $1200 for all

17 56 = 2, 2, 2, 7
63 = 3, 3, 7
77 = 11, 7
7 to each pupil
56 + 63 + 77 = 196
196 ÷ 7 = 28 pupils

18 7 | 7 11 14 22
11 | 11 2 22
2 | 2 2
= 154 cards

19 18 = 2, 3, 3
33 = 3, 11
3 to each
18 + 33 = 51, ÷ 3 = 17 children

FRACTIONS

98 Page 74

1 $45\frac{11}{12} = \frac{540+11}{12} = \frac{551}{12}$

$72\frac{9}{10} = \frac{720+9}{10} = \frac{729}{10}$

2 $109\frac{7}{9} = \frac{981+7}{9} = \frac{988}{9}$

$25\frac{7}{12} = \frac{300+7}{12} = \frac{307}{12}$

3 $58\frac{2}{19} = \frac{1102+2}{19} = \frac{1104}{19}$

$19\frac{1}{38} = \frac{722+1}{38} = \frac{723}{38}$

4 $140\frac{7}{8} = \frac{1120+7}{8} = \frac{1127}{8}$

$14\frac{5}{24} = \frac{336+5}{24} = \frac{341}{24}$

5 $13\frac{9}{13} = \frac{169+9}{13} = \frac{178}{13}$

$17\frac{5}{8} = \frac{136+5}{8} = \frac{141}{8}$

6 $85\frac{8}{15} = \frac{1275+8}{15} = \frac{1283}{15}$

$63\frac{7}{10} = \frac{630+7}{10} = \frac{637}{10}$

7 $49\frac{4}{7} = \frac{343+4}{7} = \frac{347}{7}$

$20\frac{13}{14} = \frac{280+13}{14} = \frac{293}{14}$

8 $240\frac{1}{3} = \frac{720+1}{3} = \frac{721}{3}$

$10\frac{7}{15} = \frac{150+7}{15} = \frac{157}{15}$

9 $15\frac{3}{16} = \frac{240+3}{16} = \frac{243}{16}$

$18\frac{5}{24} = \frac{432+5}{24} = \frac{437}{24}$

10 $104\frac{1}{5} = \frac{520+1}{5} = \frac{521}{5}$

$106\frac{5}{6} = \frac{636+5}{6} = \frac{641}{6}$

11 $78\frac{7}{8} = \frac{624+7}{8} = \frac{631}{8}$

$49\frac{11}{12} = \frac{588+11}{12} = \frac{599}{12}$

12 $10\frac{9}{50} = \frac{500+9}{50} = \frac{509}{50}$

$19\frac{7}{20} = \frac{380+7}{20} = \frac{387}{20}$

101 Page 75

§84

1 $\frac{5135}{270} = \frac{23}{56}\frac{23}{} = \frac{1}{2}$

2 $\frac{3}{1017}\frac{207}{} = \frac{3}{339}\frac{69}{} = \frac{23}{113}$

3 $\frac{2}{4706}\frac{702}{} = \frac{13}{2353}\frac{351}{} = \frac{27}{181}$

4 $\frac{1001}{11011}\frac{3003}{} = \frac{3}{11}$

5 $\frac{725}{4350}\frac{725}{} = \frac{1}{6}$

6 $\frac{29}{203}\frac{87}{} = \frac{3}{7}$

7 $\frac{3}{750}\frac{129}{} = \frac{43}{250}$

8 $\frac{3}{597}\frac{237}{} = \frac{79}{199}$

9 $\frac{5}{975}\frac{555}{} = \frac{3}{195}\frac{111}{} = \frac{37}{65}$

10 $\frac{2}{714}\frac{510}{} = \frac{3}{357}\frac{255}{} = \frac{17}{119}\frac{85}{} = \frac{5}{7}$

11 $\frac{2}{1818}\frac{378}{} = \frac{9}{909}\frac{189}{} = \frac{21}{101}$

12 $\frac{3}{1101}\frac{1011}{} = \frac{337}{367}$

13 $\frac{6}{438}\frac{246}{} = \frac{41}{73}$

14 $\frac{8}{720}\frac{256}{} = \frac{2}{90}\frac{32}{} = \frac{16}{45}$

15 $\frac{9}{981}\frac{711}{} = \frac{79}{109}$

16 $\frac{17}{841}\frac{329}{} = \frac{7}{18}$

17 $\frac{31}{496}\frac{279}{} = \frac{9}{16}$

18 $\frac{71}{284}\frac{213}{} = \frac{3}{4}$

§86

1 (19) $\frac{6}{42}\frac{24}{} = \frac{4}{7}$

2 (20) $\frac{11}{187}\frac{33}{} = \frac{3}{17}$

3 (21) $\frac{^{4}120}{216} = \frac{^{6}30}{54} = \frac{5}{9}$

4 (22) $\frac{^{10}90}{180} = \frac{^{9}9}{18} = \frac{1}{2}$

5 (23) $\frac{^{9}45}{108} = \frac{5}{12}$

6 (24) $\frac{^{5}85}{95} = \frac{17}{19}$

7 (25) $\frac{^{6}72}{168} = \frac{^{4}12}{28} = \frac{3}{7}$

8 (26) $\frac{119}{132}$ not reducible.

9 (27) $\frac{^{6}24}{120} = \frac{^{4}4}{20} = \frac{1}{5}$

10 (28) $\frac{^{12}36}{144} = \frac{^{3}3}{12} = \frac{1}{4}$

11 (29) $\frac{^{5}105}{135} = \frac{^{3}21}{27} = \frac{7}{9}$

12 (30) $\frac{^{12}144}{180} = \frac{^{3}12}{15} = \frac{4}{5}$

13 (31) $\frac{^{5}105}{175} = \frac{^{7}21}{35} = \frac{3}{5}$

14 (32) $\frac{^{9}99}{252} = \frac{11}{28}$

15 (33) $\frac{^{11}132}{165} = \frac{^{3}12}{15} = \frac{4}{5}$

16 (34) $\frac{^{10}60}{120} = \frac{^{6}6}{12} = \frac{1}{2}$

17 (35) $\frac{^{6}420}{864} = \frac{^{2}70}{144} = \frac{35}{72}$

18 (36) $\frac{^{15}75}{120} = \frac{5}{8}$

19 (37) $\frac{^{4}108}{252} = \frac{27}{63} = \frac{3}{7}$

20 (38) $\frac{^{13}39}{65} = \frac{3}{5}$

21 (39) $\frac{^{12}84}{132} = \frac{7}{11}$

22 (40) $\frac{^{7}168}{539} = \frac{24}{77}$

23 (41) $\frac{^{4}112}{168} = \frac{^{7}28}{42} = \frac{^{2}4}{6} = \frac{2}{3}$

24 (42) $\frac{^{41}287}{369} = \frac{7}{9}$

25 (43) $\frac{^{55}55}{110}=\frac{1}{2}$

26 (44) $\frac{^{3}81}{141}=\frac{27}{47}$

27 (45) $\frac{^{13}78}{169}=\frac{6}{13}$

28 (46) $\frac{^{10}150}{330}=\frac{^{3}15}{33}=\frac{5}{11}$

29 (47) $\frac{^{11}99}{132}=\frac{^{3}9}{12}=\frac{3}{4}$

30 (48) $\frac{^{5}120}{165}=\frac{^{3}24}{33}=\frac{8}{11}$

31 (49) $\frac{^{4}12}{252}=\frac{^{3}30}{63}=\frac{10}{21}$

32 (50) $\frac{^{17}85}{102}=\frac{5}{6}$

33 (51) $\frac{^{7}42}{91}=\frac{6}{13}$

34 (52) $\frac{^{2}34}{44}=\frac{17}{22}$

35 (53) $\frac{^{7}28}{98}=\frac{^{2}4}{14}=\frac{2}{7}$

36 (54) $\frac{^{10}110}{210}=\frac{11}{21}$

§95

2 (55) $\frac{7}{119}=\frac{1}{17}$

4 (56) $\frac{^{9}27}{36}=\frac{3}{4}$

5 (57) $\frac{4}{8}=\frac{1}{2}$

6 (58) $\frac{^{5}180}{225}=\frac{^{9}36}{45}=\frac{4}{5}$

7 (59) $\frac{^{4}112}{144}=\frac{^{4}28}{36}=\frac{7}{9}$

9 (60) $\frac{^{41}41}{164}=\frac{1}{4}$

10 (61) $\frac{^{11}33}{77}=\frac{3}{7}$

10 (62) $\frac{^{3}48}{75}=\frac{16}{25}$

11 (63) $\frac{^{5}25}{80}=\frac{5}{16}$

13 (64) $\frac{^{5}375}{390}=\frac{^{3}75}{78}=\frac{25}{26}$

13 (65) $\frac{^{11}209}{220}=\frac{19}{20}$

15 (66) $\frac{^{3}27}{42}=\frac{9}{14}$

16 (67) $\frac{^{17}17}{51}=\frac{1}{3}$

16 (68) $\frac{^{29}29}{58}=\frac{1}{2}$

18 (69) $\frac{^{7}28}{49}=\frac{4}{7}$

20 (70) $\frac{^{2}18}{32}=\frac{9}{16}$

103 Page 76

Answers to 103 will be found in 107

104 Page 77

1 $\frac{7}{8}\times\frac{5}{5}=\frac{35}{40}$; $\frac{3}{5}\times\frac{8}{8}=\frac{24}{40}$; $\frac{15}{4}\times\frac{10}{10}=\frac{150}{40}$

2 $\frac{119}{7}=\frac{13}{1}\times\frac{17}{17}=\frac{289}{17}$; $\frac{7}{119}=\frac{1}{17}$; $\frac{13}{17}=\frac{13}{17}$

3 $\frac{1}{4}\times\frac{18}{18}=\frac{18}{72}$; $\frac{5}{9}\times\frac{8}{8}=\frac{40}{72}$; $\frac{17}{8}\times\frac{9}{9}=\frac{153}{72}$

4 $\frac{27}{36}=\frac{3}{4}\times\frac{22}{22}=\frac{66}{88}$; $\frac{45}{22}\times\frac{4}{4}=\frac{180}{88}$; $\frac{3}{8}\times\frac{11}{11}=\frac{33}{88}$

5 $\frac{4}{8}\times\frac{5}{5}=\frac{20}{40}$; $\frac{27}{8}\times\frac{5}{5}=\frac{135}{40}$; $\frac{127}{5}\times\frac{8}{8}=\frac{1016}{40}$

6 $\frac{125}{120}=\frac{125}{120}$; $\frac{13}{15}\times\frac{8}{8}=\frac{104}{120}$; $\frac{180}{225}=\frac{4}{5}\times\frac{24}{24}=\frac{96}{120}$

7 $\frac{2}{3}\times\frac{3}{3}=\frac{6}{9}$; $\frac{125}{3}\times\frac{3}{3}=\frac{375}{9}$; $\frac{112}{144}=\frac{7}{9}$

8 $\frac{54}{33}=\frac{18}{11}$; $\frac{1}{11}=\frac{1}{11}$; $\frac{153}{3}=\frac{51}{1}$, $\times\frac{11}{11}=\frac{561}{11}$

9 $\frac{41}{164}=\frac{1}{4}=\frac{25}{100}$; $\frac{117}{10}=\frac{1170}{100}$; $\frac{3}{25}=\frac{12}{100}$

10 $\frac{11}{50}=\frac{77}{350}$; $\frac{33}{77}=\frac{3}{7}=\frac{150}{350}$; $\frac{48}{75}=\frac{16}{25}=\frac{224}{350}$

11 $\frac{25}{80}=\frac{5}{16}=\frac{15}{48}$; $\frac{3}{9}=\frac{1}{3}=\frac{16}{48}$; $\frac{5}{16}=\frac{15}{48}$

12 $\frac{5}{12}=\frac{35}{84}$; $\frac{187}{7}=\frac{2244}{84}$; $\frac{209}{11}=\frac{19}{1}=\frac{1596}{84}$

13 $\frac{401}{130}=\frac{802}{260}$; $\frac{375}{390}=\frac{125}{130}=\frac{250}{260}$; $\frac{209}{220}=\frac{19}{20}=\frac{247}{260}$

14 $\frac{7}{9}=\frac{56}{72}$; $\frac{111}{3}=\frac{2664}{72}$; $\frac{5}{8}=\frac{45}{72}$

15 $\frac{7}{8}=\frac{49}{56}$; $\frac{9}{14}=\frac{36}{56}$; $\frac{27}{42}=\frac{9}{14}=\frac{36}{56}$

16 $\frac{11}{14}=\frac{33}{42}$; $\frac{17}{51}=\frac{1}{3}=\frac{14}{42}$; $\frac{29}{58}=\frac{1}{2}=\frac{21}{42}$

17 $\frac{260}{11}=\frac{7540}{319}$; $\frac{501}{29}=\frac{5511}{319}$; $\frac{7}{11}=\frac{203}{319}$

18 $\frac{5}{7}=\frac{80}{112}$; $\frac{28}{49}=\frac{4}{7}=\frac{64}{112}$; $\frac{7}{16}=\frac{49}{112}$

19 $\frac{130}{7}=\frac{1040}{56}$; $\frac{58}{16}=\frac{29}{8}=\frac{203}{56}$; $\frac{1}{56}=\frac{1}{56}$

20 $\frac{133}{19}=\frac{7}{1}=\frac{112}{16}$; $\frac{18}{32}=\frac{9}{16}$; $\frac{9}{12}=\frac{3}{4}=\frac{12}{16}$

21 $\frac{1}{2}=\frac{10}{20}$; $\frac{3}{4}=\frac{15}{20}$; $\frac{171}{10}=\frac{342}{20}$

107 Page 78

1 $\frac{8}{12}=\frac{2}{3}=\frac{20}{30}$; $\frac{7}{14}=\frac{1}{2}=\frac{15}{30}$; $\frac{6}{10}=\frac{3}{5}=\frac{18}{30}$

$$\frac{20+15+18}{30}=\frac{53}{30}=1\tfrac{23}{30}$$

2 $\frac{9}{15}=\frac{3}{5}=\frac{36}{60}$; $\frac{14}{21}=\frac{2}{3}=\frac{40}{60}$; $\frac{18}{24}=\frac{3}{4}=\frac{45}{60}$

$$\frac{36+40+45}{60}=\frac{121}{60}=2\tfrac{1}{60}$$

3 $\frac{18}{27}=\frac{2}{3}=\frac{16}{24}$; $\frac{20}{32}=\frac{5}{8}=\frac{15}{24}$; $\frac{18}{36}=\frac{1}{2}=\frac{12}{24}$

$$\frac{16+15+12}{24}=\frac{43}{24}=1\tfrac{19}{24}$$

4 $\frac{5}{15}=\frac{1}{3}=\frac{8}{24}$; $\frac{8}{48}=\frac{1}{6}=\frac{4}{24}$; $\frac{6}{48}=\frac{1}{8}=\frac{3}{24}$

$$\frac{8+4+3}{24}=\frac{15}{24}=\frac{5}{8}$$

5 $\frac{6}{9}=\frac{2}{3}=\frac{8}{12}$; $\frac{4}{48}=\frac{1}{12}$; $\frac{12}{48}=\frac{3}{12}$ $\qquad \frac{8+1+3}{12}=\frac{12}{12}=1$

6 $\frac{18}{30}=\frac{3}{5}$; $\frac{15}{30}=\frac{1}{2}$; $\frac{20}{30}=\frac{2}{3}$ $\qquad \frac{18+15+20}{30}=\frac{53}{30}=1\frac{23}{30}$

7 $\frac{30}{36}=\frac{5}{6}=\frac{25}{30}$; $\frac{24}{30}=\frac{4}{5}$; $\frac{24}{36}=\frac{2}{3}=\frac{20}{30}$

$$\frac{25+24+20}{30}=\frac{69}{30}=2\frac{9}{10}$$

8 $\frac{15}{35}=\frac{3}{7}=\frac{12}{28}$; $\frac{42}{49}=\frac{6}{7}=\frac{24}{28}$; $\frac{21}{28}=\frac{3}{4}$

$$\frac{12+24+21}{28}=\frac{57}{28}=2\frac{1}{28}$$

9 $\frac{12}{36}=\frac{1}{3}=\frac{8}{24}$; $\frac{16}{32}=\frac{1}{2}=\frac{12}{24}$; $\frac{28}{32}=\frac{7}{8}=\frac{21}{24}$

$$\frac{8+12+21}{24}=\frac{41}{24}=1\frac{17}{24}$$

10 $\frac{16}{24}=\frac{2}{3}=\frac{20}{30}$; $\frac{16}{20}=\frac{4}{5}=\frac{24}{30}$; $\frac{13}{20}=\frac{9}{10}=\frac{27}{30}$

$$\frac{20+24+27}{30}=\frac{71}{30}=2\frac{11}{30}$$

11 $\frac{8}{18}=\frac{4}{9}=\frac{48}{108}$; $\frac{20}{60}=\frac{1}{3}=\frac{36}{108}$; $\frac{5}{60}=\frac{1}{12}=\frac{9}{108}$

$$\frac{48+36+9}{108}=\frac{93}{108}=\frac{31}{36}$$

12 $\frac{10}{35}=\frac{2}{7}$; $\frac{7}{35}=\frac{1}{5}$; $\frac{14}{35}=\frac{14}{35}$ $\qquad \frac{10+7+14}{35}=\frac{31}{35}$

13 $\frac{36}{42}=\frac{6}{7}=\frac{30}{35}$; $\frac{36}{45}=\frac{4}{5}=\frac{28}{35}$; $\frac{33}{55}=\frac{3}{5}=\frac{21}{35}$

$$\frac{30+28+21}{35}=\frac{79}{35}=2\tfrac{9}{35}$$

14 $\frac{33}{44}=\frac{3}{4}=\frac{9}{12}$; $\frac{36}{54}=\frac{2}{3}=\frac{8}{12}$; $\frac{5}{10}=\frac{1}{2}=\frac{6}{12}$

$$\frac{9+8+6}{12}=\frac{23}{12}=1\tfrac{11}{12}$$

15 $\frac{16}{48}=\frac{1}{3}=\frac{2}{6}$; $\frac{30}{60}=\frac{1}{2}=\frac{3}{6}$; $\frac{45}{54}=\frac{5}{6}$

$$\frac{2+3+5}{6}=\frac{10}{6}=1\tfrac{2}{3}$$

16 $\frac{15}{45}=\frac{1}{3}=\frac{20}{60}$; $\frac{12}{60}=\frac{1}{5}=\frac{12}{60}$; $\frac{10}{40}=\frac{1}{4}=\frac{15}{60}$;

$$\frac{20+12+15}{60}=\frac{47}{60}$$

17 (1) $\frac{20+15}{30}=\frac{35}{30}$, $-\frac{18}{30}=\frac{17}{30}$

18 (2) $\frac{36+40}{60}=\frac{76}{60}, -\frac{45}{60}=\frac{31}{60}$

19 (3) $\frac{16+15}{24}=\frac{31}{24}, -\frac{12}{24}=\frac{19}{24}$

20 (4) $\frac{2+1}{6}=\frac{3}{6}=\frac{1}{2}=\frac{4}{8}, -\frac{1}{8}=\frac{3}{8}$

21 (5) $\frac{8+1}{12}=\frac{9}{12}=\frac{3}{4}, -\frac{1}{4}=\frac{1}{2}$

22 (6) $\frac{18+15}{30}=\frac{33}{30}, -\frac{20}{30}=\frac{13}{30}$

23 (7) $\frac{25+24}{30}=\frac{49}{30}, -\frac{20}{30}=\frac{29}{30}$

24 (8) $\frac{3+6}{7}+\frac{9}{7}=\frac{36}{28}, -\frac{21}{28}=\frac{15}{28}$

25 (9) $\frac{8+12}{24}=\frac{20}{24}; \frac{21}{24}=\frac{20}{24}=\frac{1}{24}$

26 (10) $\frac{20+24}{30}=\frac{44}{30}, -\frac{27}{30}=\frac{17}{30}$

27 (11) $\frac{4+3}{9}=\frac{7}{9}=\frac{28}{36}, -\frac{3}{36}=\frac{25}{36}$

28 (12) $\frac{10+7}{35}=\frac{17}{35}, -\frac{14}{35}=\frac{3}{35}$

29 (13) $\frac{30+28}{35}=\frac{58}{35}, -\frac{21}{35}=1\frac{2}{35}$

30 (14) $\frac{9+8}{12}=\frac{17}{12}, -\frac{6}{12}=\frac{11}{12}$

31 (15) $\frac{2+3}{6}=\frac{5}{6}, -\frac{5}{6}=0$

32 (16) $\frac{20+12}{60}=\frac{32}{60}, -\frac{15}{60}=\frac{17}{60}$

109 Page 78

1 $\frac{35}{40}+4\frac{24}{40}+3\frac{30}{40}=7\frac{89}{40}=9\frac{9}{40}$

2 $17+\frac{1}{17}+5\frac{13}{17}=22\frac{14}{17}$

3 $72\frac{18}{72}+18\frac{40}{72}+2\frac{9}{72}=92\frac{67}{72}$

4 $\frac{66}{88}+2\frac{48}{88}+\frac{33}{88}=2\frac{103}{88}=3\frac{15}{88}$

5 $\frac{20}{40}+3\frac{15}{40}+25\frac{16}{40}=28\frac{51}{40}=29\frac{11}{40}$

6 $1\frac{5}{120}+13\frac{104}{120}+\frac{96}{120}=14\frac{205}{120}=15\frac{17}{24}$

7 $144\frac{6}{9}+41\frac{6}{9}+\frac{7}{9}=185\frac{19}{9}=187\frac{1}{9}$

8 $1\frac{7}{11}+25\frac{1}{11}+51=77\frac{8}{11}$

9 $\frac{25}{100}+11\frac{70}{100}+49\frac{12}{100}=60\frac{107}{100}=61\frac{7}{100}$

10 $19\frac{77}{350}+\frac{150}{350}+\frac{224}{350}=19\frac{451}{350}=20\frac{101}{350}$

11 $\frac{15}{48}+15\frac{16}{48}+12\frac{15}{48}=27\frac{46}{48}=27\frac{23}{24}$

12 $23\frac{3}{8}\frac{5}{4}+26\frac{6}{8}\frac{0}{4}+19=68\frac{8}{8}\frac{5}{4}=69\frac{1}{8}\frac{1}{4}$

13 $3\frac{2}{2}\frac{2}{6}\frac{2}{0}+\frac{2}{2}\frac{5}{6}\frac{0}{0}+\frac{2}{2}\frac{4}{6}\frac{7}{0}=3\frac{5}{2}\frac{1}{6}\frac{9}{0}=4\frac{2}{2}\frac{5}{6}\frac{9}{0}$

14 $23\frac{5}{7}\frac{6}{2}+37+17\frac{4}{7}\frac{8}{2}=77\frac{1}{7}\frac{0}{2}\frac{1}{}=78\frac{2}{7}\frac{9}{2}$

15 $29\frac{4}{5}\frac{9}{6}+4\frac{3}{5}\frac{6}{6}+\frac{3}{5}\frac{8}{6}=33\frac{1}{5}\frac{2}{6}\frac{1}{}=35\frac{9}{5}\frac{}{6}$

16 $\frac{3}{4}\frac{3}{2}+\frac{1}{4}\frac{4}{2}+\frac{2}{4}\frac{1}{2}=\frac{6}{4}\frac{8}{2}=1\frac{1}{2}\frac{3}{1}$

17 $23\frac{2}{3}\frac{0}{1}\frac{3}{9}+17\frac{8}{3}\frac{8}{1}\frac{}{9}+\frac{2}{3}\frac{0}{1}\frac{3}{9}=40\frac{4}{3}\frac{9}{1}\frac{4}{9}=41\frac{1}{3}\frac{7}{1}\frac{5}{9}$

18 $11\frac{8}{1}\frac{0}{1}\frac{}{2}+\frac{6}{1}\frac{4}{1}\frac{}{2}+21\frac{4}{1}\frac{9}{1}\frac{}{2}=32\frac{1}{1}\frac{0}{1}\frac{3}{2}=33\frac{8}{1}\frac{1}{1}\frac{}{2}$

19 $18\frac{2}{5}\frac{3}{6}+3\frac{3}{5}\frac{5}{6}+7\frac{1}{5}\frac{}{6}=28\frac{6}{5}\frac{5}{6}=29\frac{5}{1}\frac{}{4}$

20 $7+\frac{9}{1}\frac{}{6}+13\frac{1}{1}\frac{3}{6}=20\frac{2}{1}\frac{1}{6}=21\frac{5}{1}\frac{}{6}$

21 $41\frac{1}{2}\frac{0}{0}+47\frac{1}{2}\frac{5}{0}+17\frac{2}{2}\frac{}{0}=105\frac{2}{2}\frac{7}{0}=106\frac{7}{2}\frac{}{0}$

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1 $45\frac{3}{3}\frac{3}{6}-\frac{2}{3}\frac{8}{6}=45\frac{7}{3}\frac{}{6}$; $72\frac{1}{9}\frac{1}{0}-\frac{6}{9}\frac{5}{0}=72\frac{}{4}\frac{8}{5}$

2 $109\frac{1}{1}\frac{4}{8}-\frac{1}{1}\frac{3}{8}=109\frac{1}{1}\frac{}{8}$; $25\frac{2}{3}\frac{1}{6}-\frac{2}{3}\frac{8}{6}=24\frac{3}{3}\frac{1}{6}$

3 $58\frac{3}{3}\frac{6}{4}\frac{}{2}-\frac{2}{3}\frac{4}{4}\frac{7}{2}=57\frac{1}{3}\frac{3}{4}\frac{1}{2}$; $19\frac{9}{3}\frac{}{4}\frac{}{2}-\frac{2}{3}\frac{4}{4}\frac{7}{2}=18\frac{1}{3}\frac{0}{4}\frac{4}{2}$

4 $140\frac{6}{7}\frac{3}{2}-\frac{5}{7}\frac{2}{2}=140\frac{1}{7}\frac{1}{2}$; $14\frac{1}{7}\frac{5}{2}-\frac{5}{7}\frac{2}{2}=13\frac{3}{7}\frac{5}{2}$

5 $13\frac{1}{2}\frac{6}{3}\frac{2}{4}-\frac{1}{2}\frac{6}{3}\frac{9}{4}=12\frac{2}{2}\frac{2}{3}\frac{7}{4}$; $17\frac{4}{7}\frac{5}{2}-\frac{5}{7}\frac{2}{2}=16\frac{6}{7}\frac{5}{2}$

6 $85\frac{4}{9}\frac{8}{0}-\frac{6}{9}\frac{5}{0}=84\frac{7}{9}\frac{3}{0}$; $63\frac{8}{9}\frac{8}{0}-\frac{6}{9}\frac{5}{0}=62\frac{4}{4}\frac{}{5}$

7 $49\frac{7}{1}\frac{2}{2}\frac{}{6}-\frac{9}{1}\frac{1}{2}\frac{}{6}=48\frac{1}{1}\frac{7}{2}\frac{7}{6}$; $20\frac{1}{1}\frac{1}{2}\frac{7}{6}-\frac{9}{1}\frac{1}{2}\frac{}{6}=20\frac{1}{6}\frac{3}{3}$

8 $240\frac{5}{1}\frac{}{8}-\frac{1}{1}\frac{3}{8}=239\frac{1}{1}\frac{1}{8}$; $10\frac{4}{9}\frac{2}{0}-\frac{6}{9}\frac{5}{0}=9\frac{8}{9}\frac{7}{0}$

9 $15\frac{27}{144} - \frac{104}{144} = 14\frac{67}{144}$; $18\frac{15}{72} - \frac{52}{72} = 17\frac{35}{72} = 30$

10 $104\frac{18}{90} - \frac{65}{90} = 103\frac{43}{90}$; $106\frac{15}{18} - \frac{18}{18} = 106\frac{1}{9}$

11 $78\frac{63}{72} - \frac{52}{72} = 78\frac{11}{72}$; $49\frac{33}{36} - \frac{26}{36} = 49\frac{7}{36}$

12 $10\frac{81}{450} - \frac{225}{450} = 9\frac{206}{450} = 9\frac{103}{225}$; $19\frac{63}{180} - \frac{130}{180} = 18\frac{113}{180}$

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1 $41\frac{1}{4} + 3\frac{2}{4} + \frac{3}{4} = \$45\frac{1}{2}$

2 $155\frac{35}{40} + 76\frac{30}{40} + 111\frac{32}{40} = 342\frac{97}{40} = 344\frac{17}{40}$

3 $723\frac{17}{20} - 149\frac{19}{20} = 573\frac{18}{20} = 573\frac{9}{10}$

4 $125 - 13\frac{3}{4} = \$111\frac{1}{4}$ cost.

5 $\frac{18}{99} + \frac{22}{99} = \frac{40}{99}$; $\frac{99}{99} - \frac{40}{99} = \frac{59}{99}$

6 $\frac{110}{110} - \frac{43}{110} = \frac{67}{110}$

7 $31\frac{9}{33} + 46\frac{22}{33} + 59\frac{19}{33} = 137\frac{17}{33}$ rd.

8 $17\frac{4}{8} + 23\frac{5}{8} + 41\frac{6}{8} = 82\frac{7}{8}$ $\quad 237\frac{11}{16} - 82\frac{14}{16} = 154\frac{13}{16}$ lb.

9 $8\frac{28}{60} + 9\frac{23}{60} + 11\frac{55}{60} + 80\frac{21}{60} + 13\frac{6}{60} + 13\frac{50}{60} = 65\frac{1}{30}$ hr.

10 $27\frac{128}{160} + 34\frac{148}{160} + 31\frac{25}{160} = 93\frac{141}{160}$ $\quad 179\frac{120}{160} - 93\frac{141}{160} = 85\frac{139}{160}$ mi.

11 $17\frac{48}{72} + 18\frac{8}{72} + 14\frac{63}{72} = 50\frac{47}{72}$ $\quad 108\frac{18}{72} - 50\frac{47}{72} = 57\frac{43}{72}$ yd.

12 $101\frac{7}{12} - 53\frac{4}{12} = 48\frac{1}{4}$ ft.

13 $\frac{14}{91} - \frac{13}{91} = \frac{1}{91}$

14 $37\frac{24}{128} + 41\frac{112}{128} + 29\frac{15}{128} + 54\frac{76}{128} = 162\frac{99}{128}$ cd.

15 $171\frac{77}{165}+235\frac{75}{165}=406\frac{152}{165}$ mi.

16 $235\frac{75}{65}-171\frac{77}{65}=63\frac{168}{165}$ mi.

17 $119\frac{128}{160}+91\frac{35}{160}+75\frac{110}{160}=286\frac{108}{160}$ A

18 $\frac{85}{170}+\frac{34}{170}+\frac{30}{170}=\frac{149}{170}$. $\frac{170}{170}-\frac{149}{170}=\frac{21}{170}$

19 $17\frac{10}{24}+17\frac{12}{24}+14\frac{11}{24}+14\frac{11}{24}=63\frac{3}{4}$ ft.

20 $117\frac{7}{10}+7\frac{2}{10}=\$124\frac{9}{10}$

21 $53\frac{12}{15}+41\frac{10}{15}=95\frac{7}{15}$ hr.

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1 $45\frac{11}{12}\times 11=495\frac{121}{12}=505\frac{1}{12}$

$72\frac{9}{10}\times 11=792\frac{99}{10}=801\frac{9}{10}$

2 $109\frac{7}{9}\times 11=1199\frac{77}{9}=1207\frac{5}{9}$

$25\frac{7}{12}\times 11=275\frac{77}{12}=281\frac{5}{12}$

3 $58\frac{2}{19}\times 11=638\frac{22}{19}=639\frac{3}{19}$

$19\frac{1}{8}\times 11=209\frac{11}{8}$

4 $140\frac{7}{8}\times 11=1540\frac{77}{8}=1549\frac{5}{8}$

$14\frac{5}{24}\times 11=154\frac{55}{24}=156\frac{7}{24}$

5 $13\frac{9}{13}\times 13=169+9=178$

$17\frac{5}{8}\times 13=221\frac{65}{8}=229\frac{1}{8}$

6 $85\frac{8}{15}\times 13=1105\frac{104}{15}=1111\frac{14}{15}$

$63\frac{7}{10}\times 13=819\frac{91}{10}=828\frac{1}{10}$

7 $49\frac{4}{3} \times 12 = 637\frac{6}{7}^{2} = 644\frac{3}{7}$

$20\frac{1}{1}\frac{3}{9} \times 13 = 260\frac{1}{1}\frac{6}{4}\frac{9}{} = 272\frac{1}{14}$

8 $240\frac{1}{3} \times 13 = 3120\frac{1}{3}^{3} = 3124\frac{1}{3}$

$10\frac{7}{1}\frac{}{5} \times 14 = 130\frac{9}{1}\frac{1}{5} = 136\frac{1}{15}$

9 $15\frac{3}{1}\frac{}{6} \times 17 = 255\frac{5}{1}\frac{1}{6} = 258\frac{3}{16}$

$18\frac{5}{2}\frac{}{4} \times 17 = 306\frac{5}{2}\frac{5}{4} = 309\frac{1}{2}\frac{}{4}$

10 $104\frac{1}{5} \times 17 = 1768\frac{1}{5}^{7} = 1771\frac{2}{5}$

$106\frac{5}{6} \times 17 = 1802\frac{8}{6}^{5} = 1816\frac{1}{6}$

11 $78\frac{7}{8} \times 17 = 1326\frac{1}{8}^{1}\frac{9}{} = 1340\frac{7}{8}$

$49\frac{1}{1}\frac{}{2} \times 17 = 1133\frac{1}{1}\frac{8}{2}^{7} = 848\frac{7}{12}$

12 $10\frac{9}{5}\frac{}{0} \times 17 = 170\frac{1}{5}\frac{5}{0}^{3} = 173\frac{3}{50}$

$19\frac{7}{2}\frac{}{0} \times 17 = 323\frac{1}{2}\frac{1}{0}^{9} = 328\frac{1}{2}\frac{9}{0}$

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1 $25 \times \$7\frac{3}{4} = \$193\frac{3}{4}$

2 $19 \times \$2\frac{3}{5} = \$49\frac{2}{5}$

3 $160 \times \$65\frac{1}{2} = \$10480$

4 $12 \times 31\frac{1}{2} = 378$ gal.

5 $175 \times \$1\frac{1}{1}\frac{}{0} = \$192\frac{1}{2}$

6 $11 \times 3\frac{1}{3}\frac{9}{2} = 39\frac{1}{3}\frac{7}{2}$ mi.

7 $12 \times 18\frac{7}{1}\frac{}{5} = 221\frac{3}{5}$ hrs.

8 $6 \times 12\frac{1}{3}\frac{3}{0} = 74\frac{3}{5}$ pp.

9 $12 \times \$728\frac{5}{6} = \$8746$

10 $80 \times 5\frac{1}{2} = 440$ yds.

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(The cancellation, being simple, is not indicated)

1 $\frac{2}{3}$ of $15 = 10$

2 $\frac{2}{3}$ of $29 = \frac{5}{3}^{8} = 19\frac{1}{3}$

3 $\frac{2}{3}$ of $31 = \frac{6}{3}^{2} = 20\frac{2}{3}$

4 $\frac{2}{3}$ of $23 = \frac{4}{3}^{6} = 15\frac{1}{3}$

5 $\frac{2}{3}$ of $18 = 12$

6 $\frac{2}{3}$ of $9 = 6$

7 $\frac{2}{3}$ of $0 = 0$

8 $\frac{2}{3}$ of $24 = 16$

9 $\frac{2}{3}$ of $17 = \frac{3}{3}^{4} = 11\frac{1}{3}$

10 $\frac{2}{3}$ of $27 = 18$

11 $\frac{2}{3}$ of $14 = \frac{28}{3} = 9\frac{1}{3}$

12 $\frac{2}{3}$ of $11 = \frac{22}{3} = 7\frac{1}{3}$

13 $\frac{3}{7}$ of $44 = \frac{132}{7} = 18\frac{6}{7}$

14 $\frac{3}{7}$ of $37 = \frac{111}{7} = 15\frac{6}{7}$

15 $\frac{3}{7}$ of $28 = 12$

16 $\frac{3}{7}$ of $19 = \frac{57}{7} = 8\frac{1}{7}$

17 $\frac{3}{7}$ of $7 = 3$

18 $\frac{3}{7}$ of $14 = 6$

19 $\frac{3}{7}$ of $24 = \frac{72}{7} = 10\frac{2}{7}$

20 $\frac{3}{7}$ of $32 = \frac{96}{7} = 13\frac{5}{7}$

21 $\frac{3}{7}$ of $46 = \frac{138}{7} = 19\frac{5}{7}$

22 $\frac{3}{7}$ of $56 = 24$

23 $\frac{3}{7}$ of $38 = \frac{114}{7} = 16\frac{2}{7}$

24 $\frac{3}{7}$ of $43 = \frac{129}{7} = 18\frac{3}{7}$

25 $\frac{5}{9}$ of $22 = \frac{110}{9} = 12\frac{2}{9}$

26 $\frac{5}{9}$ of $35 = \frac{175}{9} = 19\frac{4}{9}$

27 $\frac{5}{9}$ of $41 = \frac{205}{9} = 22\frac{7}{9}$

28 $\frac{5}{9}$ of $80 = \frac{400}{9} = 44\frac{4}{9}$

29 $\frac{5}{9}$ of $72 = 40$

30 $\frac{5}{9}$ of $56 = \frac{280}{9} = 31\frac{1}{9}$

31 $\frac{5}{9}$ of $19 = \frac{95}{9} = 10\frac{5}{9}$

32 $\frac{5}{9}$ of $7 = \frac{35}{9} = 3\frac{8}{9}$

33 $\frac{5}{9}$ of $26 = \frac{130}{9} = 14\frac{4}{9}$

34 $\frac{5}{9}$ of $81 = 45$

35 $\frac{5}{9}$ of $93 = \frac{465}{9} = 51\frac{2}{3}$

36 $\frac{5}{9}$ of $45 = 25$

37 $\frac{5}{6}$ of $36 = 30$

38 $\frac{5}{6}$ of $43 = \frac{215}{6} = 35\frac{5}{6}$

39 $\frac{5}{6}$ of $14 = \frac{35}{3} = 11\frac{2}{3}$

40 $\frac{5}{6}$ of $8 = \frac{20}{3} = 6\frac{2}{3}$

41 $\frac{5}{6}$ of $49 = \frac{245}{6} = 40\frac{5}{6}$

42 $\frac{5}{6}$ of $53 = \frac{265}{6} = 44\frac{1}{6}$

43 $\frac{5}{6}$ of $62 = \frac{155}{3} = 51\frac{2}{3}$

44 $\frac{5}{6}$ of $25 = \frac{125}{6} = 20\frac{5}{6}$

45 $\frac{5}{6}$ of $33 = \frac{55}{2} = 27\frac{1}{2}$

46 $\frac{5}{6}$ of $18 = 15$

47 $\frac{5}{6}$ of $42 = 35$

48 $\frac{5}{6}$ of $51 = \frac{85}{2} = 42\frac{1}{2}$

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(The cancellation, being simple, is not indicated)

1 $\frac{55}{56} \times \frac{7}{11} = \frac{5}{8}$

2 $\frac{13}{25} \times \frac{5}{39} = \frac{1}{15}$

3 $\frac{14}{15} \times \frac{25}{28} = \frac{5}{6}$

4 $\frac{11}{16} \times \frac{7}{8} = \frac{77}{128}$

5 $\frac{57}{108} \times \frac{12}{19} = \frac{1}{3}$

6 $\frac{75}{105} \times \frac{84}{120} = \frac{1}{2}$

7 $\frac{85}{108} \times \frac{81}{95} = \frac{51}{76}$

8 $\frac{84}{119} \times \frac{17}{24} = \frac{1}{2}$

9 $\frac{55}{81} \times \frac{141}{143} = \frac{235}{351}$

10 $\frac{39}{60} \times \frac{40}{65} = \frac{2}{5}$

11 $\frac{21}{26} \times \frac{13}{14} = \frac{3}{4}$

12 $\frac{19}{20} \times \frac{13}{20} = \frac{247}{400}$

13 $\frac{32}{75} \times \frac{25}{48} = \frac{2}{9}$

14 $\frac{325}{7} \times \frac{1}{25} = \frac{13}{7} = 1\frac{6}{7}$

15 $\frac{3}{160} \times \frac{32}{9} = \frac{1}{15}$

16 $\frac{7}{64} \times \frac{24}{35} = \frac{3}{40}$

17 $\frac{150}{151} \times \frac{3}{5} = \frac{90}{151}$

18 $\frac{19}{38} \times \frac{7}{14} = \frac{1}{4}$

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(The cancellation, being simple, is not indicated)

1 $\frac{21}{5}\times\frac{15}{2}=\frac{63}{2}=31\frac{1}{2}$

2 $\frac{11}{3}\times\frac{29}{5}=\frac{319}{15}=21\frac{4}{15}$

3 $\frac{73}{8}\times\frac{75}{8}=\frac{5475}{64}=85\frac{35}{64}$

4 $\frac{47}{6}\times\frac{60}{7}=\frac{470}{7}=67\frac{1}{7}$

5 $\frac{29}{8}\times\frac{7}{4}=\frac{203}{32}=6\frac{11}{32}$

6 $\frac{50}{9}\times\frac{35}{3}=\frac{1750}{27}=64\frac{22}{27}$

7 $\frac{48}{5}\times\frac{59}{8}=\frac{354}{5}=70\frac{4}{5}$

8 $\frac{53}{10}\times\frac{100}{11}=\frac{530}{11}=48\frac{2}{11}$

9 $\frac{42}{5}\times\frac{77}{10}=\frac{1617}{25}=64\frac{17}{25}$

10 $\frac{38}{3}\times\frac{47}{6}=\frac{893}{9}=99\frac{2}{9}$

11 $\frac{9}{2}\times\frac{23}{4}=\frac{207}{8}=25\frac{7}{8}$

12 $\frac{48}{7}\times\frac{23}{3}=\frac{368}{7}=52\frac{4}{7}$

13 $\frac{113}{12}\times\frac{71}{8}=\frac{8023}{96}=83\frac{55}{96}$

14 $\frac{87}{11}\times\frac{55}{7}=\frac{435}{7}=62\frac{1}{7}$

15 $\frac{75}{6}\times\frac{101}{10}=\frac{505}{4}=126\frac{1}{4}$

16 $\frac{47}{3}\times\frac{53}{9}=\frac{2491}{27}=92\frac{7}{27}$

17 $\frac{551}{12}\times\frac{729}{10}=\frac{133893}{40}=3347\frac{13}{40}$

18 $\frac{988}{9}\times\frac{307}{12}=\frac{75829}{27}=2808\frac{13}{27}$

19 $\frac{1104}{19}\times\frac{723}{38}=\frac{399096}{361}=1105\frac{191}{361}$

20 $\frac{1127}{8}\times\frac{341}{24}=\frac{384307}{192}=2001\frac{115}{192}$

21 $\frac{178}{13}\times\frac{141}{8}=\frac{12549}{52}=241\frac{17}{52}$

22 $\frac{1283}{15}\times\frac{637}{10}=\frac{817271}{150}=5448\frac{71}{150}$

23 $\frac{347}{7}\times\frac{293}{14}=\frac{101671}{98}=1037\frac{45}{98}$

24 $\frac{721}{3}\times\frac{157}{15}=\frac{13197}{45}=2515\frac{22}{45}$

25 $\frac{243}{16}\times\frac{437}{24}=\frac{35397}{128}=276\frac{69}{128}$

26 $\frac{521}{5}\times\frac{641}{6}=\frac{333961}{30}=11132\frac{1}{30}$

27 $\frac{631}{8}\times\frac{599}{12}=\frac{377969}{96}=3937\frac{17}{96}$

28 $\frac{509}{50}\times\frac{387}{20}=\frac{196983}{1000}=196\frac{983}{1000}$

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1 $\frac{75}{4}\times\frac{47}{20}=\frac{705}{16}=\$44\frac{1}{16}$

2 $\frac{65}{3}\times\frac{98}{5}=\frac{1274}{3}=424\frac{2}{3}$ mi.

3 $\frac{725}{16}\times\frac{68}{5}=\frac{2465}{4}=\$616\frac{1}{4}$

4 $\frac{39}{4}\times\frac{1}{4}=\frac{39}{16}=\$2\frac{7}{16}$

5 $\frac{43}{2}\times\frac{25}{2}=\frac{1075}{4}=268\frac{3}{4}$ cts.

6 $\frac{1581}{8}\times\frac{35}{3}=\frac{8445}{8}=2305\frac{5}{8}$ lb.

7 $\frac{19}{4}\times\frac{17}{2}=\frac{323}{8}=\$40\frac{3}{8}$

8 $\frac{239}{8}\times\frac{9}{4}=\frac{2151}{32}=\$67\frac{7}{32}$

9 $\frac{119}{16}\times\frac{141}{7}=\frac{2397}{16}=149\frac{13}{16}$ mi.

10 $\frac{139}{5}=\frac{19}{2}=\frac{2641}{10}=264\frac{1}{10}$ mi.

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1 $\frac{21}{5} \div \frac{15}{2} = \frac{21}{5} \times \frac{2}{15} = \frac{14}{25}$

2 $\frac{11}{3} \div \frac{29}{5} = \frac{11}{3} \times \frac{5}{29} = \frac{55}{87}$

3 $\frac{73}{8} \div \frac{75}{8} = \frac{73}{8} \times \frac{8}{75} = \frac{73}{75}$

4 $\frac{47}{6} \div \frac{60}{7} = \frac{47}{6} \times \frac{7}{60} = \frac{329}{360}$

5 $\frac{29}{8} \div \frac{7}{4} = \frac{29}{8} \times \frac{4}{7} = 2\frac{1}{14}$

6 $\frac{50}{9} \div \frac{35}{3} = \frac{50}{9} \times \frac{3}{35} = \frac{10}{21}$

7 $\frac{48}{5} \div \frac{59}{8} = \frac{48}{5} \times \frac{8}{59} = 1\frac{85}{295}$

8 $\frac{53}{10} \div \frac{100}{11} = \frac{53}{10} \times \frac{11}{100} = \frac{583}{1000}$

9 $\frac{42}{5} \div \frac{77}{10} = \frac{42}{5} \times \frac{10}{77} = \frac{1}{11}$

10 $\frac{38}{3} \div \frac{47}{6} = \frac{38}{3} \times \frac{6}{47} = 1\frac{28}{47}$

11 $\frac{9}{2} \div \frac{23}{4} = \frac{9}{2} \times \frac{4}{23} = \frac{18}{23}$

12 $\frac{48}{7} \div \frac{23}{3} = \frac{48}{7} \times \frac{3}{23} = \frac{144}{161}$

13 $\frac{113}{12} \div \frac{71}{8} = \frac{113}{12} \times \frac{8}{71} = 1\frac{126}{213}$

14 $\frac{87}{11} \div \frac{55}{7} = \frac{87}{11} \times \frac{7}{55} = 1\frac{476}{605}$

15 $\frac{75}{6} \div \frac{101}{10} = \frac{75}{6} \times \frac{10}{101} = 1\frac{224}{606}$

16 $\frac{47}{3} \div \frac{53}{9} = \frac{47}{3} \times \frac{9}{53} = 2\frac{135}{159}$

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1 $\frac{286}{10} \div \frac{13}{5} = \frac{286}{10} \times \frac{5}{13} = 11$

2 $\frac{491}{2} \div \frac{7}{2} = \frac{491}{2} \times \frac{2}{7} = 70\frac{1}{7}$ da.

3 $30 \div \frac{41}{12} = \frac{30}{1} \times \frac{12}{41} = 8\frac{232}{41}$

4 $\frac{507}{4} \div \frac{39}{4} = \frac{507}{4} \times \frac{4}{39} = 13$

5 $\frac{169}{6} \div \frac{13}{6} = \frac{169}{6} \times \frac{6}{13} = 13$ dresses

6 $\frac{1833}{4} \div \frac{1833}{16} = \frac{1833}{4} \times \frac{16}{1833} = 4$ sons

7 $3 \div \frac{1}{9} = 3 \times 9 = 27$ divisions

8 $\frac{33}{2} \div \frac{11}{6} = \frac{33}{2} \times \frac{6}{11} = 9$ steps

9 $\frac{116}{3} \div \frac{29}{4} = \frac{116}{3} \times \frac{4}{29} = \frac{16}{3} = 5\frac{1}{3}$ da

10 $16 = \frac{5}{4} = 16 \times \frac{4}{5} = \frac{64}{5} = 12\frac{4}{5}$ cu. ft.

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1 $\frac{1}{3} \times \frac{7}{9} \times \frac{9}{5} = \frac{7}{15}$

2 $\frac{3}{2} \times \frac{3}{2} \times \frac{4}{3} = 3$

3 $\frac{7}{1} \times \frac{3}{1} \times \frac{5}{9} \times \frac{4}{9} \times \frac{9}{8} = \frac{35}{6} = 5\frac{5}{6}$

4 $\frac{11}{1} \times \frac{2}{3} \times \frac{7}{22} = \frac{7}{3} = 2\frac{1}{3}$

5 $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}, \div \frac{1}{6} = 5$

6 $\frac{7}{3} \div \frac{66}{7} = \frac{7}{3} \times \frac{7}{66} = \frac{49}{198}$

7 $8\frac{1}{8} - 3\frac{2}{3} = \frac{68}{15}$; $1\frac{2}{3} + 1\frac{2}{15} = \frac{42}{15}$

$\frac{68}{15} \div \frac{42}{15} = \frac{34}{21} = 1\frac{13}{21}$

8 $4\frac{1}{2} - \frac{3}{4} = \frac{15}{4}$ $\frac{15}{4} \div \frac{15}{7} = \frac{7}{4} = 1\frac{3}{4}$

9 $\frac{15}{2} \div \frac{15}{16} = \frac{15}{2} \times \frac{16}{15} = 8$

10 $\frac{2}{3} + \frac{3}{4} = \frac{17}{12}$; $\frac{5}{6} - \frac{3}{4} = \frac{1}{12}$

$\frac{17}{12} \div \frac{1}{12} = 17$

11 $8\frac{1}{3} \div 3\frac{1}{4} = \frac{25}{3} \times \frac{4}{13} = \frac{5}{2} = 2\frac{1}{2}$

12 $\frac{1}{2} + \frac{2}{3} - \frac{3}{4} = \frac{5}{12}$;

$\frac{5}{12} \div \frac{1}{12} = 5$

13 $\frac{25}{2} \div 100 = \frac{1}{8}$

14 $\frac{75}{2} \div 100 = \frac{3}{8}$

15 $\frac{100}{3} \div 100 = \frac{1}{3}$

16 $\frac{125}{2} \div 100 = \frac{5}{8}$

17 $\frac{200}{3} \div 100 = \frac{2}{3}$

18 $\frac{50}{3} \div 100 = \frac{1}{6}$

19 $\frac{175}{2} \div 100 = \frac{7}{8}$

20 $\frac{250}{3} \div 100 = \frac{5}{6}$

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1 $\frac{1}{5} = \frac{1}{5}$ of $125 = 25$; $\frac{6}{6} = 6 \times 25 = 150$

2 $\frac{1}{11} = \frac{1}{9}$ of $144 = 16$; $\frac{11}{11} = 11 \times 16 = 176$

3 $\frac{1}{4} = \frac{1}{3}$ of $321 = 107$; $\frac{4}{4} = 4 \times 107 = 428$

4 $\frac{9}{9} = 9 \times 45 = 405$

5 $\frac{1}{12} = \frac{1}{3}$ of $540 = 108$; $\frac{12}{12} = 12 \times 108 = 1296$

6 $\frac{1}{107} = \frac{1}{107}$ of $642 = 6$; $\frac{100}{100} = 100 \times 6 = 600$

7 $\frac{1}{12} = \frac{1}{7}$ of $840 = 120$; $\frac{12}{12} = 12 \times 120 = 1440$

8 $\frac{7}{7} = 7 \times 59 = 413$

9 $\frac{1}{13} = \frac{1}{9}$ of $189 = 21$; $\frac{13}{13} = 13 \times 21 = 273$

10 $\frac{1}{11} = \frac{1}{10}$ of $910 = 91$; $\frac{11}{11} = 11 \times 91 = 1001$

PRACTICAL FRACTIONS

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1 $\frac{1}{4}$ of $36 = $9; $5 \times $9 = $45

2 $175 \div 875 = \frac{175}{875} = \frac{1}{5}$

3 $\frac{1}{2}$ of $250 = 125$; $5 \times 125 = 625$ sheep

4 $\frac{1}{5}$ of $1575 = $315; $6 \times $315 = $1890

5 $\frac{1}{2}$ of $12300 = $6150; $3 \times $6150 = $18450

6 $\frac{1}{15}$ of $18450 = $1230; $7 \times $1230 = $8610

7 $\frac{10250}{18450} = \frac{(41)250}{369(50)} = \frac{5}{9}$

8 $\frac{5}{8}$ of $\frac{15}{4} = \frac{5}{4} = $4\frac{1}{2}$

9 $\frac{1}{8}$ of $75 = $25; $\frac{4}{4} = 4 \times $25 = 100 value

$\frac{8}{8} = $100; $\frac{1}{3} = $33\frac{1}{3}$; $\frac{2}{3} = 2 \times $33\frac{1}{3} = $66\frac{2}{3}$

10 $\frac{5}{8}$ of $\frac{8}{8} = \frac{5}{8}$; $\frac{1}{8} = \frac{1}{3}$ of $5760 = $1920; $8 \times $1920 = 15360

11 $\frac{4}{5}$ of $\frac{5}{8} = \frac{1}{4}$; $\frac{1}{4}$ of $15360 = 3840

12 $5 \div 65 = \frac{5}{65} = \frac{1}{13}$

13 $\frac{3}{2}\frac{1}{4}\frac{1}{8}=\frac{1}{8}$; $\frac{8}{8}-\frac{1}{8}=\frac{7}{8}$ left

14 $\frac{1}{3}$ of $108=12$; $20\times12=240$A.

15 $\frac{5}{5}-\frac{2}{5}=\frac{3}{5}=1200$. $\frac{1}{3}$ of $1200=400$. $5\times400=2000$ sheep.

16 $\frac{5}{9}$ of $\frac{2}{5}\frac{7}{}=\$3$

17 $\$2325-\$1800=\$525$. Ans. $\frac{5}{2}\frac{2}{3}\frac{5}{5}=\frac{7}{3}\frac{7}{1}$

18 $\frac{3}{3}-\frac{2}{3}=\frac{1}{3}$; $\frac{1}{3}$ of $\$1575=\$525$.

19 $\frac{1}{3}\frac{2}{2}\frac{8}{0}=\frac{8}{2}\frac{}{0}=\frac{2}{5}$

20 $\frac{1}{1}\frac{3}{3}-\frac{5}{1}\frac{}{3}=\frac{8}{1}\frac{}{3}=8800$. $\frac{1}{8}$ of $8800=1100\times13=14300$ men.

REVIEW IN FRACTIONS

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1 $\frac{3}{4}\frac{9}{}\div\frac{1}{8}\frac{8}{}=\frac{3}{4}\frac{9}{}\times\frac{8}{1}\frac{}{3}=6$ yds.

2 $\frac{2}{2}\frac{3}{}\times\frac{7}{2}\frac{5}{}=\frac{1}{4}\frac{7}{2}\frac{5}{}=\$431\frac{1}{4}$. $\frac{7}{4}\frac{1}{}\times42=\frac{1}{2}\frac{4}{}\frac{9}{1}=\$745\frac{1}{2}$, $\$431\frac{1}{4}+\$745\frac{1}{2}=\$1176\frac{3}{4}$. $\frac{2}{2}\frac{3}{}\text{A}+\frac{7}{4}\frac{1}{}\text{A}=\frac{1}{4}\frac{1}{}\frac{7}{}=29\frac{1}{4}$ A.

3 $\frac{4}{4}\frac{3}{}\frac{5}{}\div\frac{8}{2}\frac{7}{}=\frac{4}{4}\frac{3}{}\frac{5}{}\times\frac{2}{8}\frac{}{7}=\frac{5}{2}=\$2\frac{1}{2}$ per yd. $\frac{2}{2}\frac{5}{}\times\frac{5}{2}=\frac{1}{4}\frac{2}{}\frac{5}{}=\$31\frac{1}{4}$.

4 $\frac{2}{1}\frac{}{3}\times\frac{8}{4}\frac{9}{}\times\frac{4}{3}\times\frac{5}{2}=3$.

5 $\frac{1}{3}+\frac{1}{6}=\frac{1}{2}$. $\frac{2}{2}-\frac{1}{2}=\frac{1}{2}$ left. $\frac{1}{2}$ of $175\frac{1}{2}=87\frac{3}{4}$A. $87\frac{3}{4}\times45=\$3948\frac{3}{4}$

6 $20\times\frac{1}{5}=\$4$; $\$4\div\frac{1}{4}=16$ lbs.

7 $\$2250\times\frac{7}{5}=\$3150$.

8 $\frac{1}{8}\frac{4}{}\frac{0}{8}\div\frac{2}{8}\frac{3}{}=\frac{1}{8}\frac{4}{}\frac{0}{3}\times\frac{8}{2}\frac{}{3}=61$ coats.

9 $17\frac{2}{3}+17\frac{2}{3}+12\frac{5}{8}+12\frac{5}{8}=\frac{14}{2}\frac{54}{4}\times 3\frac{1}{2}=\frac{50}{24}\frac{89}{4}=212\frac{1}{24}$ cts.

10 $18\frac{3}{4}\times 12=225$ ct. sugar. $225\div 22\frac{1}{2}=10$ lbs. of butter.

11 $\frac{2}{5}$ of 475 A$=190$ A B's share. $\frac{2}{5}$ of 190 A$=76$ A C's share.

12 $22\frac{1}{2}\div 60=\frac{45}{2}\times\frac{1}{60}=\frac{3}{8}$

13 $17\frac{1}{2}+3\frac{4}{5}+7\frac{1}{4}+5\frac{1}{2}=\$33\frac{4}{5}$. $\$63\frac{3}{4}-\$33\frac{4}{5}=\$29\frac{19}{20}$.

14 $104\frac{1}{2}\div 5\frac{1}{2}=\frac{209}{22}\times\frac{2}{11}=19$ rds.

15 $320\times\frac{11}{2}=1760$ yds.

16 $517\frac{9}{10}-27\frac{6}{10}=\$490\frac{3}{10}$.

17 $7\frac{1}{5}\div\frac{9}{10}=\frac{36}{5}\times\frac{10}{9}=8$ lots.

18 $7\frac{1}{2}\div\frac{3}{5}=\frac{15}{2}\times\frac{5}{3}=12\frac{1}{2}$ yds.

19 $99\div 3\frac{2}{3}=27$ cts. per lb. $\frac{3}{4}$ of 27cts.$=20\frac{1}{4}$cts.

20 $19\times\frac{19}{20}=\frac{361}{20}=18\frac{1}{20}$ tons.

21 $14\div 7\frac{7}{8}=14\times\frac{8}{63}=\frac{16}{9}=\$1\frac{7}{9}$.

22 $\frac{3}{10}+\frac{4}{15}=\frac{17}{30}$; $\frac{17}{30}$ of $\frac{5}{9}=\frac{17}{54}$; $\frac{5}{9}-\frac{17}{54}=\frac{13}{54}$.

23 $\frac{1}{18}$ of $324=18$. $18=\frac{2}{19}$; $\frac{1}{19}=\frac{1}{2}$ of $18=9$. $9\times 19=171$ cattle B's

24 $\frac{3}{11}$ of $4774=\$1302$. A's share. $\frac{9}{22}$ of $\$4774=\$1953$ B's share.

$\$4774-(1302+1953=\$3255)=\$1519$ C's share

25 $2\frac{7}{8}+2\frac{1}{8}+\frac{7}{8}=\frac{47}{8}$. $60\frac{1}{2}\div\frac{47}{8}=10$ suits. $\frac{14}{8}$ yds. rem. $\frac{14}{8}\div\frac{7}{8}=2$

26 In one day A will do $\frac{1}{13}$ of the work, and B $\frac{1}{14}$
" " A & B will do $\frac{1}{13}$ & $\frac{1}{14} = \frac{27}{182}$. $182 \div 27 = 6\frac{20}{27}$ days

27 $6\frac{1}{20} \div 5\frac{1}{2} = \frac{121}{20} \times \frac{2}{11} = \$1\frac{1}{10}$ cost per cental. $12\frac{1}{10} \div 1\frac{1}{10} = \frac{121}{10} \times \frac{10}{11}$
$= 11$ centals

28 $\frac{2}{3} + \frac{1}{8} = \frac{19}{24}$. $\frac{24}{24} - \frac{19}{24} = \frac{5}{24}$ left. $150 = \frac{5}{24}$; $\frac{24}{24} = 150 \times \frac{24}{5} = 720$ hogs

29 $127\frac{1}{2} \times 1\frac{1}{5} = \$150$ wheat. $18 \times 1\frac{1}{4} = \$22\frac{1}{2}$ oats. $75 \times \frac{19}{20} = \$71\frac{1}{4}$
barley. $\$153 + \$22\frac{1}{2} + \$71\frac{1}{4} = \$246\frac{3}{4}$ total value.

30 $321 \div 4 = \$80\frac{1}{4}$ per A. $11\frac{5}{16} \times \$80\frac{1}{4} = \frac{5\,8\,1\,0\,1}{6\,4} = \$907\frac{5}{6\,4}$.

31 $1 \div 47\frac{2}{13} = 1 \times \frac{13}{613} = \frac{13}{613}$.

32 $35 \times 1\frac{9}{10} = \$66\frac{1}{2}$ carpet. $3 \times \frac{4}{5} = \$2\frac{2}{5}$ curtains. $5 \times \frac{3}{4} = \$3\frac{3}{4}$
chairs. $\$66\frac{1}{2} + \$2\frac{2}{5} + \$3\frac{3}{4} = \$72\frac{13}{20}$.

33 22 mi. $\times \frac{1}{4} = 5\frac{1}{2}$ hrs., A's time. 22 mi. $\times \frac{3}{11} = 6$ hrs. B's time.
B travels 1 mi. in $\frac{3}{11}$ hrs., in 1 hr. he travels $\frac{11}{3}$ mi. in $\frac{1}{2}$ hr.
$\frac{1}{2}$ of $\frac{11}{3} = 1\frac{5}{6}$ mi. behind A.

34 In one day A and B do $\frac{1}{10}$ of the work; A and C, $\frac{1}{12}$; and
B and C, $\frac{1}{15}$; All will do $\frac{1}{2}$ of the sum of $\frac{1}{10} + \frac{1}{12} + \frac{1}{15} = \frac{1}{8}$ of
work in one day, or 8 days to complete work. Since B and
C do $\frac{1}{15}$ in a day, A will do $\frac{1}{8} - \frac{1}{15} = \frac{7}{120}$. $120 \div 7 = 17\frac{1}{7}$ da. A.
Since A and C do $\frac{1}{12}$ in a day, B will do $\frac{1}{8} - \frac{1}{12} = \frac{1}{24}$. in 1 da.,
or all in 24 days, B. Since A and B do $\frac{1}{10}$ in a day C will
do $\frac{1}{8} - \frac{1}{10} = \frac{1}{40}$ in 1 day, or all in 40 days, C.

35 $49\frac{3}{4}\text{A} - 9\frac{7}{8}\text{A} = 39\frac{7}{8}\text{A}$. $\$3190 \div 39\frac{7}{8} = 3190 \times \frac{8}{319} = \$80$.

36 $\$20 \div 33\frac{1}{3} = 20 \times \frac{3}{100} = \$\frac{3}{5}$.

37 $\frac{1}{2} \div 2\frac{1}{4} = \frac{1}{2} \times \frac{4}{9} = \frac{2}{9}$ yards.

38 $169 \div 3\frac{1}{4} = 169 \times \frac{4}{13} = 52$ sheep.

39 $3\frac{3}{5} \div 1\frac{9}{10} = \frac{18}{5} \times \frac{10}{9} = 4$ children.

40 $23\frac{3}{4} \div \frac{5}{16} = \frac{95}{4} \times \frac{16}{5} = \$76$.

41 $62\frac{1}{2} \div 50 = \frac{125}{2} \times \frac{1}{50} = \$\frac{5}{4}$ per sack. $12 \times \frac{5}{4} = \$15$.

42 $\frac{1}{7} + \frac{1}{10} = \frac{17}{70}$ spent. $\frac{70}{70} - \frac{17}{70} = \frac{53}{70}$ saved. $106 = \frac{53}{70}$. $\frac{70}{70} = 106 \times \frac{70}{53} = \$140$.

43 $\frac{2}{3}$ of B's$+\frac{1}{3}$ of B's$=\frac{4}{3}$ of B's$=\$1728$. $1728 \div \frac{4}{3} = \$1296$ B's money. $\frac{1}{3}$ of $\$1296 = \$432$ A's money.

44 $17\frac{1}{2} \times 5\frac{1}{5} \times 18\frac{3}{4} = \dfrac{35 \times 26 \times 75}{2 \times 5 \times 4} = \dfrac{6825}{4} = \$1706\frac{1}{4}$

45 $81\frac{1}{3} \div \frac{2}{3} = \frac{244}{3} \times \frac{3}{2} = 122$ dipperfuls

46 $588 \div 24\frac{1}{2} = 24$ cattle. $\$27\frac{3}{4} - \$24\frac{1}{2} = \$3\frac{1}{4}$ gain on each. $\$3\frac{1}{4} \times 24 = \$78$ total gain.

47 $3\frac{13}{16} + 5\frac{7}{16} = 9\frac{1}{4}$. $9\frac{1}{4} \div \frac{4}{37} = \frac{37}{4} \times \frac{37}{4} = \frac{1369}{16} = 85\frac{9}{16}$.

48 Let $\frac{3}{3}$ = C's share; then A's $= \frac{2}{3}$ of C's, and B's twice $\frac{2}{3}$, or $\frac{4}{3}$ of C's. $\frac{3}{3} + \frac{2}{3} + \frac{4}{3}$, or $\frac{9}{3}$ of C's share $= \$2835$. $\frac{1}{3} = \frac{1}{9}$ of $\$2835 = \$315$. $\frac{2}{3} = 2 \times \$315 = \$630$ A's share, $\frac{4}{3} = 4 \times \$315 = \$1260$ B's share. $\frac{3}{3} = 3 \times \$315 = \$945$ C's share.

49 $\frac{2}{19}$ of $\frac{380}{3} = 40$ lbs. $\$34 \div 40 = \$.85$ per lb.

50 Let A's = $\frac{3}{3}$, then B's = $\frac{5}{3}$ of A's, and C's $\frac{7}{5}$ of $\frac{5}{3} = \frac{7}{3}$ of A's. $\frac{3}{3} + \frac{5}{3} + \frac{7}{3}$, or $\frac{15}{3}$ of A's = \$15300. $\frac{1}{3} = \frac{1}{15}$ of \$15300 = \$1020. $3 \times \$1020 = \$3060$ A's money; $5 \times \$1020 = \$5100$ B's money; $7 \times \$1020 = \$7140$ C's money.

51 $5\frac{1}{2} \div \frac{3}{3} = \$\frac{33}{4}$ cost of one cord. $17\frac{1}{2} \times \frac{33}{4} = \frac{1155}{8} = \$144\frac{3}{8}$ total cost.

52 $35\frac{45}{80} + 47\frac{40}{80} + 17\frac{48}{80} = 100\frac{73}{80}$ A, $100\frac{73}{80} \times 40 = \$4036\frac{1}{2}$ Am't rec'd

53 $1000 \div 1\frac{1}{4} = 1000 \times \frac{4}{5} = 800$ centals.

54 $\frac{39}{78} + \frac{76}{78} = 1\frac{37}{78}$ Sum. $\frac{76}{78} - \frac{39}{78} = \frac{37}{78}$ Diff. $\frac{13}{26} \times \frac{38}{39} = \frac{19}{39}$ Product.

55 $5\frac{1}{2} \times 40 = 220$ cts. for butter; $10\frac{1}{3} \times 18 = 186$ cts. for eggs; 220 cts. + 186 cts. = 406 cts for both. 406cts. $\div 7\frac{1}{4} = 406 \times \frac{4}{29} =$ 56 lbs.

56 $\$41\frac{3}{10} - \$3\frac{4}{5} = \$37\frac{1}{2}$. $\$37\frac{1}{2} \div 12\frac{1}{2} = \frac{75}{2} \times \frac{2}{25} = \$3$.

57 $8\frac{1}{2} \times \$15 = 127\frac{1}{2}$ cost of coal. $9\frac{2}{3} \times 7\frac{1}{2} = \$72\frac{1}{2}$ cost of wood. $\$127\frac{1}{2} + \$72\frac{1}{2} = \$200$ total cost.

58 $40 \times \$63 = \$2520$ cost. $\frac{5}{16}$ of 40 A. $\times \$72 = \$900$. $\frac{3}{20}$ of 40 A. $\times \$59\frac{1}{2} = \$357$. $21\frac{1}{2}$ A $\times \$65\frac{1}{2} = \$1408\frac{1}{4}$. $\$900 + \$357 + \$1408\frac{1}{4} = \$2665\frac{1}{4}$ total receipts. $\$2665\frac{1}{4} - \$2520 = \$145\frac{1}{4}$ gain.

59 $\frac{3}{7}$ of $189 = 81$. $81 \div 567 = \frac{1}{7}$ Ans.

60 Let 1 = A's loan, then will 2 = B's, and 3 the total loan. A paid back $\frac{1}{2}$ of $1 = \frac{1}{2}$. B paid $\frac{1}{2}$ of $2 = 1$. Total payments $= 1\frac{1}{2}$, or $\frac{1}{2}$ of the whole. $\$150 = \frac{1}{2}$, total loan = \$300, of which A had $\frac{1}{3}$, or \$100, and B $\frac{2}{3}$, or \$200.

61 $35\frac{1}{2} \times 47\frac{2}{3} = \frac{71}{2} \times \frac{143}{3} = \frac{10153}{6} = 1692\frac{1}{6}$ yds.

62 $40 \times 2\frac{7}{20} = 94$ cwt.

63 $94\text{cwt.} \div 20 = 4\frac{7}{10}$ T.

64 $365\frac{1}{4} \times 24 = 8766$ hours.

65 $14 \times \$23\frac{1}{2} = \$329$ cost of cows. $11 \times \$85\frac{3}{4} = \$943\frac{1}{4}$ cost of horses. $50 \times \$2\frac{3}{4} = \$137\frac{1}{2}$ cost of sheep. $\$329 + \$943\frac{1}{4} + \$137\frac{1}{2} = \$1409\frac{3}{4}$. total cost. $\$1500 - \$1409\frac{3}{4} = \$90\frac{1}{4}$ left.

66 $\frac{1}{10}$ of $15 = \$1\frac{1}{2}$ gain. $\$12\frac{3}{4}$ cost $+ \$1\frac{1}{2}$ gain $= \$14\frac{1}{4}$ S. P.

67 $9\frac{33}{50} = \frac{483}{50}$. $\frac{483}{50} + \frac{50}{50} = \frac{533}{50}$; 533 mi. $= \frac{533}{50}$ of distance to San José $533 \div \frac{533}{50} = 50$ mi. to San José. 533 mi. $- 50$ mi. $= 483$ mi. to Los Angeles.

68 For every day the first worked, the second worked three days, and the third two days, $1 + 3 + 2 = 6$ parts to the work. $\$12.30 \div 6 = \$2.05$ one part, or share of first; $3 \times \$2.05 = \$6.15$ share of second; $2 \times \$2.05 = \$4.10$ share of third.

69 $3\frac{1}{2} + 3\frac{3}{8} = 6\frac{7}{8}$ mi. apart in one hour. $6\frac{7}{8} \times 13\frac{3}{3} = 93\frac{3}{24}$ mi. total distance.

70 $3\frac{1}{2} - 3\frac{3}{8} = \frac{1}{8}$ mi. in 1 hr. $\frac{1}{8}$ of $13\frac{3}{8} = 1\frac{17}{24}$ mi. total distance.

71 $2483\frac{1}{4} \div 225\frac{3}{4} = \frac{9933}{4} \times \frac{4}{903} = 11$ bbl.

72 $2\frac{1}{4} \div \frac{3}{8} = \frac{9}{4} \times \frac{8}{3} = 6$ collars.

73 $81\frac{10}{20} + 98\frac{16}{20} + 105\frac{15}{20} + 112\frac{15}{20} = \$398\frac{4}{5}$ total value. $398\frac{4}{5} \div 4 = \$99\frac{7}{10}$ average value.

74 $35 \times \$15\frac{1}{2} = \$342\frac{1}{2}$ C. $+ \$17\frac{1}{2}$ G. $= \$560$ S. P. $560 \div 35 = \$16$ each.

75 $\frac{4}{15}$ of $375 = 100$ oranges. $\frac{3}{15}$ of $375 = 75$ oranges. $375 - 175 = 200$, $\times 1\frac{3}{4}$ cts. $= 350$ cts.

76 $30\frac{1}{4}+42\frac{1}{5}=72\frac{9}{20}$ yds. $241\frac{1}{2}\div 72\frac{9}{20}=\$3\frac{1}{3}$ per yard

77 $\frac{4}{5}+\frac{5}{5}=\frac{9}{5}$ of dist. W. traveled. $\frac{1}{5}=\frac{1}{9}$ of $5\frac{2}{3}=\frac{8}{5}$ mi. $4\times\frac{3}{5}=2\frac{2}{5}$ mi. dist. R. traveled. $5\times\frac{3}{5}=3$ mi. dist. W. traveled.

78 $365-60=305$ days. $305\times\frac{3}{4}=\$228\frac{3}{4}$.

79 $28\frac{3}{4}\div 11\frac{1}{2}=\frac{115}{4}\times\frac{2}{23}=\$\frac{5}{2}$ per box. $22\frac{1}{2}\div\frac{5}{2}=\frac{45}{2}\times\frac{2}{5}=9$ boxes.

80 $2\frac{3}{4}\times\frac{3}{4}=\frac{33}{16}$. $\frac{16}{16}+\frac{33}{16}=\frac{49}{16}$ of Frank's. $\frac{49}{16}=24\frac{1}{2}$; $\frac{1}{16}=\frac{1}{49}$ of $\$24\frac{1}{2}$ $=\$\frac{1}{2}$. $33\times\$\frac{1}{2}=\$16\frac{1}{2}$ Fred's share. $16\times\$\frac{1}{2}=\$8$ Frank's share.

DECIMAL FRACTIONS

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1

75.14000
.12500
131.13100
.07850
7.00700
.13147
1389.90000
.00910
1603.52207

2

857.14000
85.07140
.07408
.00291
405.01000
78.78000
2.04040
7814.00200
9242.12079

3

7.070700
20.000300
171.411200
27141.750000
480.700000
526.114000
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.141000
28347.257307

4

82.10730
1.01010
3150.07100
4090.07000
293.02930
47.14100
29.64100
10.10000
7703.1697

5

75.140
131.131
7.007
1389.9
1603.178

6

.125
.0785
.13147
.0091
.34407

7

857.14
2 0404
480.7
3150.071
4489.9514

8

85.0714
7814.002
526.114
4090.07
12515.2574

9

.07408
7.0707
.070107
293.0293
300.244187

10

.00291
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.1410
47.141
67.28521

11

405.01
171.4112
82.1073
29.641
688.1695

12

78.78
27141.75
1.01010
10.1
27231.6401

13

25.25
9.114
7.5
11.008
52.872

14

74.0099
11.00045
.004
.04
85.05435

15

.75
.0075
40.40
4000.004
4041.1615

16

.91
9.1
.4
1.21
11.62

7

9.
.057
5.011
72.6
86.668

18

87.54
90.8
117.041
25.009
320.39

19

238.012
171.125
328.01
190.008
927.155

20

.2
2.4
12.
17.5
32.1

21

8.3
3.75
.57
.09
12.71

22

2.496
7.125
.0125
.025
9.6585

155 Page 108

1

75.14
.125
75.015

2

857.14
85.0714
772.0686

3

857.14
.07408
857.06592

4

857.14
.00291
857.13709

5

857.14
405.01
452.13

6

857.14
78.78
778.36

7

20.0003
7.0707
12.9296

8

171.4112
7.0707
164.3405

9

27141.75
7.0707
27134.6793

10

82.1073
1.0101
81.0972

158 Page 109

1

75.14
75.14
30056
7514.
37570
52598
5646.0196

2

.125
75.14
500
125
625
875
9.39250

3

131.131
75.14
524524
131131
655655
917917
9853.18334

4

.0785
75.14
3140
785
3925
5495
5.898490

5

7.007
75.14
28028
7007
35035
49049
526.50598

6

.13147
75.14
52588
13147
65735
92929
9.8786558

7

1389.9
75.14
55596
13899
69495
97293
104437.086

8

.0091
75.14
364
91
455
637
.683774

9

75.14
1.25
37570
90168
9.39250

10

.125
.125
625
1500
.015625

11

131.131
.125
655655
1573572
16.391375

12

.0785
.125
3925
9420
.0098125

13

7.007
.125
35035
84084
.875875

14

.13147
.125
65735
157764
.01643375

15

1389.9
.125
69495
166788
173.7375

16

.0091
.125
455
1092
.0011375

17

857.14
131.131
112397.62534

18

85.0714
131.131
11155.4977534

19

.07408
131.131
9.71418448

20

.00291
131.131
.38159121

21

405.01
131.131
53109.36631

22

78.78
131.131
10330.50018

23

2.0404
131.131
267.5596924

24

7814.002
131.131
1024657.896262

25 $857.14 \times .0785 = 67.28549$

26 $85.0714 \times$ " $= 6.67810490$

27 $.07408 \times$ " $= .005815280$

28 $.00291 \times$ " $= .000228435$

29 $405.01 \times$ " $= 31.793285$

30 78.78. × .0785 = 6.184230

31 2.1404 × .0785 = .1601714

32 7814.002 × .0785 =
613.3991570

33 7.0707 × 7.007 =
49.5443949

34 20.0003 × 7.007 =
140.1421021

35 171.4112 × 7.007 =
1201.0782784

36 27141.75 × 7.007 =
190182.24225

37 480.7 × 7.007 =
3368.2649

38 526.114 × 7.007 =
3686.480798

39 .070107 × 7.007 =
.491239749

40 1410 × 7.007 =
.9879870

41 7.0707 × .13147 =
.929584929

42 20.0003 × .13147 =
2.629439441

43 171.4112 × .13147 =
22.535430464

44 27141.75 × .13147 =
3568.3258725

45 .13147 × 480.7 =
63.197629

46 526.114 × .13147 =
69.16820758

47 .070107 × .13147 =
.00921696729

48 .1410 × .13147 =
.018537270

49 $82.1073 \times 1389.9 =$

114120.93627

50 $101010 \times 1389.9 =$

1403.93799

51 $3150.071 \times 1389.9 =$

4378283.6829

52 $4090.07 \times 1389.9 =$

5684788.293

53 $293.0293 \times 1389.9 =$

407281.42407

54 $47.141 \times 1389.9 =$

65521.2759

55 $29.641 \times 1389.9 =$

41198.0259

56 $10.1 \times 1389.9 =$

14037.99

57 $82.1073 \times .0091 =$

.74717643

58 $1.01010 \times .0091 =$

.009191910

59 $3150.071 \times .0091 =$

28.6656461

60 $4090.07 \times .0091 =$

37.219637

61 $293.0293 \times .0091 =$

2.66656663

62 $47.141 \times .0091 =$

.4289831

63 $29.641 \times .0091 =$

.2697331

64 $10.1 \times .0091 =$

.09191

160 Page 109

1 $725 \times .06 = 43.5$

2 $42.5 \times .8 = 34$

3 $7.84 \times .125 = .98$

4 $17.28 \times .03 = .5184$

5 $4.096 \times .12\frac{1}{2} = .512$

6 $256 \times .16\frac{2}{3} = 42.66\frac{2}{3}$

7 $2.444 \times \frac{1}{4} = .611$

8 $515.1 \times \frac{1}{3} = 171.7$

9 $480 \times \frac{1}{20} = 24$

10 $.764 \times .175 = .1337$

11 $57.75 \times \frac{1}{25} = 2.31$

12 $1.044 \times .9 = 9.396$

13 $72400 \times \frac{1}{16} = 4525$

14 $245.4 \times .15 = 36.81$

15 $3.55 \times .8 = 2.84$

16 $96 \times \frac{1}{40} = 2.8$

17 $250 \times .28 = 70$

18 $1400 \times 1.05 = 1470$

19 $380 \times 1.2 = 456$

20 $920 \times .45 = 414$

---

162 Omitted

PRACTICAL WORK IN DECIMALS

168 Page 113

1 $240.25 \times .63 = 151.3575$ bales.

2 475 lbs. $\times .63 = 299.25$ lbs.

3 $17.6 + 23.25 + 42.625 = 83.475$ A. $83.475 \times \$40 = \$3,339.$

4 .2 of ·3125 = .0625 sold. .3125 − .0625 = .25 left

5 $36 \times \$.12\frac{1}{2} = \$4.50$

6 $648.96 \div 8 = 81.12$ A.

7 $27 \div 2.25 = 12$ books

8 $6.75 \text{ mi.} \times 11 = 74.25$ mi.

9 $2150.42 \times 5.16\frac{2}{3} = 11110.50\frac{1}{3}$ cu. in.

10 $\$1.37\frac{1}{2} \times 296 = \$407$

11 272.25 ft. ÷ 16.5 ft. = 16.5 rd.

12 Their sum, or 187.46 mi.

13 $187.46 \text{ mi.} \div 6 = 31.24\frac{1}{3}$ mi.

14 278.15 + 392.14 + 171.9 + 429.51 + 530.875 = 1802.575A.
3218A. − 1802.575A. = $1415.42\frac{1}{2}$A.

15 $42 \div 2.625 = 16$ pairs

16 231 cu. in. × 31.5 = 7276.5 cu. in

17 (32.0625 + 28.4375) × 2 = 121 rds. around

18 5280 ft. ÷ 21.96 ft. = 240.43 turns

19 $12 \times \$81.875 = \$982.50$ cost.
$\$1000 - \$982.50 = \$17.50$ left

20 $\$.162.75 \div \$7.75 = 21$ cords

21 7.231 A. + 9.124 A. + 6.715 A. = 23.07 A. ÷ 3 = 7.69 A.
23.07 A. + 7.69 A. = 30.76 A.

22 30.76 × $50 = $1538.

23 .08 + .16 + .5 = .74 spent; 1.00 − .74 ÷ .26 left.
.26 = $26, the whole = $26 ÷ .26 = $100.

24 $.33\frac{1}{3} + .45 = .78\frac{1}{3}$. $1.00 - .78\frac{1}{3} = .21\frac{2}{3}$.

25 $15.87\frac{1}{2} + 17.66\frac{2}{3} + 14.33\frac{1}{3} + 15.12\frac{1}{2} = 63$ cords.

26 $63 \times \$7\frac{4}{7} = \$477$.

27 $4\frac{3}{4} \times 8 = 38$ mi. $38 \div .59375 = 64$ times.

28 $(15\frac{5}{16} + 10.1875) \times 2 = 51$ rds. around.
$51 \times 3 = 153$ rds. of rail; $153 \times 16\frac{1}{2} = 2524\frac{1}{2}$ ft.
$2524.5 \div 7.5 = 336.6$ rails.

29 Their sum = 112.241 in. ÷ 5 = 22.4482 in. average

30 2.125 gal. × 60 = $127\frac{1}{2}$ gal.

31 17.125 = $9.60 = $164.40.

32 4.64 mi. + 5.16 mi. = 9.8 mi. distance apart in one hour.
9.8 mi. × 13 = 127.4 mi. total distance apart.

33 107.8 mi. ÷ 9.8 mi. = 11 hrs.

34 48 × 3.1416 = 150.7968 sec.

35 8000 × 3.1416 = 25132.8 mi.

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1

To 5 yds. Ribbon . @ .12½		62½			
" 11 " Bl'k Casm're " 1.60	17	60			
" 4 doz. Buttons . " .30	1	20			
" 2 yds. Silesia . " .20		40			
" 10 yds. Sheeting " .18	1	80			
" 1 pr. Gaiters, .	3	50		25	12½

2

To 5 gals. Kerosene Oil @ .25	1	25			
" 3 prs. Blankets . " 6.50	19	50			
" 25 lbs. Brown Sugar " .07	1	75			
" 3 doz. Eggs . . " .20		60			
" 1 Turkey, 12 lbs. " .22	2	64			
" 50 lbs. Potatoes . . " .01½		75		26	49

3

1880							
Mar.	3	To 2 lbs. Steak . @ .12½		25			
"	4	" 4½ lbs. Roast Beef " .12		54			
"	5	" 1¾ lbs. Sirloin " .15		26¼			
"	6	" 5½ lbs. Mutton " .10		55			
"	8	" 1 A&C Ham, 15 lbs " .19	2	85			
"	10	" 3 lbs. Veal Roast " .14		42		4	87¼

4

PETALUMA, JULY 17, 1888.

MR. M. S. JOHNSON,

To JOHN SMITH, *Dr.*

5

To Services, 12 da. @ $1.50	18	00			

To ½ doz. Wooden Chairs @ $1.	6	00			
" 1 Lounge,	12	50			
" 1 Bed Room Set,	22	75			
" 3 Fancy Chairs @ $2.25	6	75			
" 1 Extension Table,	7	50			
" 1 Center Table,	4	00		59	50

6 SAN FRANCISCO, JULY 19, 1888

MR. GEO. SIMS,

To S. WILSON, *Dr.*

7	To 10 tons Hay, @ $10.00		100	00		
	To 8 doz. Oranges,	@ .15	1	20		
	" 10 lbs. Nuts,	" .10	1	00		
	" 8 Lemons,	" .02½		20		
	" 5 lbs. Mixed Candy	" .20	1	00		
	" 1 box Apples,		1	00		
	" 7 boxes St'wb'r's,	" .45	3	15	7	55

8	To 12 Pencils,	@ .05		60		
	" ¼ ream Note Paper,			40		
	" 4 Note Books,	@ .10		40		
	" 1 Rubber Eraser,			05		
	" 1 pkg. Envelopes,			10		
	" 2 Fifth Readers,	@ .85	1	70		
	" 2 School Geog.,	@ 1 .40	2	80	6	05

9	To 14 yds. Print,	@ .12	1	68		
	" 3 lbs. Butter,	" .28		84		
	" 4 bars Soap,	" .10		40		
	" 1 pr. Child's Shoes,		1	75		
	" 25 lbs. Flour,	@ .02½		62½		
	" 1 can Lard,			65		
	" 2 lbs. Cheese,	" .17		34		
					6	28½

PART II.

WEIGHTS AND MEASURES

Linear Measure

174 page 123

30 3 mi. × 320 + 2 rds. = 962 rds., × $5\frac{1}{2}$ + $4\frac{7}{8}$ yds., = 5295.66$\frac{3}{8}$ yds., × 36 = 15.887 ft

31 3 yds. × 36 + 2 in. = 110 in. 110 in. ÷ 36 = 3.05$\frac{5}{9}$ yds.

32 1 mi. × 320 + 2 rds. = 322 rods., × $16\frac{1}{2}$ + 2 ft. = 5315 ft.
5315 ft. ÷ 5280 = 1.0066 mi.

33 3 rds. × $5\frac{1}{2}$ + 4 yds. = $20\frac{1}{2}$ yds., × 3 + 2 ft. = $63\frac{1}{2}$ ft., × 12 + 2 in. = 768 in. 768 in ÷ 12 = 64 ft.

34 2 rds. × $5\frac{1}{2}$ + 1 yd. = 12 yds., × 3 + 2 ft. = 38 ft., × 12 + 6 in. = 462 in. 462 in. ÷ 12 = 38.5 ft.

35 1 mi. × 320 + 2 rds. = 322 rds., × $5\frac{1}{2}$ + 1 yd. = 1772 yds., × 3 + 1 ft. = 5317 ft., × 12 + 6 in. = 63,810 in.
63,810 in ÷ 36 = 1772.5 yds.

36 3 mi. × 320 + 80 rds. = 1040 rds., × $16\frac{1}{2}$ = 17,160 ft.
17,160 ft. ÷ 5280 = 3.25 mi.

37 2 mi. × 320 + 2 rds. = 642 rds., × $16\frac{1}{2}$ + 3 ft. = 10,596 ft.
10,596 ft. ÷ 5280 = 2.0068+ mi.

38 3 rds. × $5\frac{1}{2}$ + 2 yds. = $18\frac{1}{2}$ yds., × 3 + 2 ft. = $57\frac{1}{2}$ ft., × 12 + 3 in. = 693 in. 693 in. ÷ 198 = 3.5 rds.

39 4 mi. $\times$ 320 + 240 rds. = 1520 rds., $\times 5\frac{1}{2}$ = 8360 yds.
8360 yds. $\div$ 1760 = 4.75 mi.

40 3 mi. $\times$ 320 + 8 rds. = 968 rds., $\times 5\frac{1}{2}$ + 3 yds. = 5327 yds., $\times$ 3 + $2\frac{1}{4}$ ft. = $15983\frac{1}{4}$ ft. $15983\frac{1}{4}$ ft. $\div$ 3 = 5327.75 yds.

41 7 rds. $\times 5\frac{1}{2}$ + 2 yds. = $40\frac{1}{2}$ yds., $\times$ 3 + 2 ft. = $123\frac{1}{2}$ ft., $\times$ 12 + 3 in. = 1485 in.

43 $4\frac{2}{7}$ rds. $\div$ 320 = $\frac{3}{2\,2\,4}$ mi.

44 $\frac{5}{6}$ mi. = .$83\frac{1}{3}$ mi.

45 .375 mi. $\times$ 320 = 120 rds.

46 2 ft. $\times$ 12 + $6\frac{3}{4}$ in. = $30\frac{3}{4}$ in., $\div$ 198 = .1553+ rds

47 65 rds. $\times 5\frac{1}{2}$ + 2 yds. = $359\frac{1}{2}$ yds., $\times$ 3 + 2 ft. = $1080\frac{1}{2}$ ft., $\times$ 12 + 6 in. = 12,972 in., $\div$ 63,360 = .2047 + mi.

48 25 rds. $\times 5\frac{1}{2} + 4\frac{1}{2}$ yds. = 142 yds., $\times$ 3 = 426 ft. 35 rds. $\times 5\frac{1}{2}$ + 3 yds. = $195\frac{1}{2}$ yds., $\times 3 + 2\frac{3}{4}$ ft. = $589\frac{1}{4}$ ft. 426 $\div$ $589\frac{1}{4}$ = .723-

49 42 rds. $\times 5\frac{1}{2}$ + 2 yds. = 233 yds., $\times$ 36 + 4.3 in. = 8342.3 in., $\div$ 63,360 = .1324 + mi.

50 6 ft. $\times$ 12 + 8.5 in. = 80.5., $\div$ 198 = .4065+ rds.

51 $3\frac{1}{2}$ yds. $\times$ 36 = 126 in. 7 yds. $\times$ 36 + 4 in. = 256 in.
126 in. $\div$ 256 in. = $\frac{6\,3}{1\,2\,8}$.

52 165 rds. $\times 5\frac{1}{2}$ + 2 yds. = $909\frac{1}{2}$ yds., $\times$ 3 + 2 ft. = $2730\frac{1}{2}$ ft., $\times$ 12 + 9 in. .32,775 in., $\div$ 63,360 = $\frac{2\,1}{4\,2}\frac{5\,5}{2\,4}$ mi.

53 2 yds. $\times$ 3 + 2 ft. = 8 ft., $\times$ 12 + 2 in. = 98 in. 3 yds. $\times$ 36 = 108 in. 98 $\div$ 108 = $\frac{4\,9}{5\,4}$

54 98 rds. $\times 5\frac{1}{2} + 7$ yds. $= 546$ yds., $\times 3 + 2$ ft. $= 1640$ ft., $\times 12 + 4$ in. $= 19{,}684$ in., $\div 63{,}360 = \frac{4921}{15840}$ mi.

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9 39.37 in. $\times 5.24 = 206.2988$ in., $\div 12 = 17$ft. 2.2988 in.; or 5 yds. 2 ft. 2.2988 in.

10 39.37 in. $\times 35.428 = 1394.80036$ in., $\div 12 = 116$ ft. 2.80036 in. 116 ft. $\div 3 = 38$ yds. 2 ft. Ans. $= 33$ yds. 2 ft. 2.80036 in.

11 39.37 in. $\times 5785 = 227{,}755.45$ in., $\div 63{,}360 = 3.594+$ mi.

12 7,856,918 in. $\div 39.37 = 199{,}566.11+$ meters.

SURFACE MEASURE

178 Page 129

18 1 sq. rd. $\times 30\frac{1}{4} \times 9 = 272\frac{1}{2}$ sq. ft., $\times 144 = 39{,}204$ sq. in.
1 A. $\times 160 \times 30\frac{1}{4} = 4840$ sq. yds., $\times 9 = 43{,}560$ sq. ft.

19 2 A. $\times 160 + 40$ sq. rds. $= 360$ sq. rds., $\times 30\frac{1}{4} = 10{,}890$ sq. yds., $\times 9 + 17$ sq. ft. $= 98{,}027$ sq. ft.

20 3 A. $\times 43{,}560 = 130{,}680$ sq. ft.

21 3 sq. mi. $\times 640 = 1920$ A., $\times 160 + 17$ sq. rds. $= 307217$ sq. rds., $\times 30\frac{1}{4} + 4$ sq. yds. $= 9{,}293{,}318\frac{1}{4}$ sq. yds.

22 3476 sq. in. $\div 144 = 24\frac{5}{36}$ sq. ft.

23 98756 sq. in. $\div 144 = 685$ sq. ft. 116 sq.in.

24 7856 sq. ft. $\div 9 = 872$ sq. yds. 8 sq. ft. 872 sq. yds. $\div 30\frac{1}{4} =$ 28 sq. rds. 25 sq. yds. Ans. $= 28$ sq. rds., 25 sq. yds. 8 sq ft.

25 48413 sq. yds. $\div 30\frac{1}{4} = 1600$ sq. rds., 13 sq. yds. 1600 sq. rds. $\div 160 = 10$ A. Ans. $= 10$ A. 13 sq. yds.

26 189.5 rds. $\times$ 150 rds. $= 28425$ sq. rds. $= 177\frac{2}{3}\frac{1}{3}$ A.
$177\frac{2}{3}\frac{1}{3}$ A. $\times \$75\frac{3}{4} = \$13{,}457.46+$.

27 37 A. $\times 160 + 128$ sq. rds. $= 6048$ sq. rds. 170 A. $\times 160 +$ 16 sq. rds. $= 27.216$ sq. rds. 27,216 sq. rds. $- 6048$ sq. rds. $=$ 21,168 sq. rds. $21{,}168 \div 27{,}216 = \frac{7}{9}$.

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10 1 sq. mi. $\times 640 \times 10 = 6400$ sq. ch., $\times 16 = 102{,}400$ sq. rds., $\times 625$ $= 64{,}000{,}000$ sq. l.

11 160 A. $= \frac{1}{4}$ sq. mi. 64,000,000 sq. l. $\div 4 = 16{,}000{,}000$.

12 2 sq. mi. $\times 640 + 6$A. $= 1286$ A., $\times 10 + 9$ sq. ch. $= 12{,}869$ sq. ch.

13 1 A. $\times 10 \times 16 \times 625 = 100{,}000$ sq. l.

14 1 sq. mi. $\times 640 + 1$ A. $= 641$ A., $\times 10 + 1$ sq. ch. $= 6411$ sq. ch., $\times 16 + 1$ sq. rd. $= 102{,}577$ sq. rd. 10,2577 sq. rd. $\times 625 =$ 64,110,625 sq. l.

15 842,590 sq. l. $\div 625 = 1348$ sq. rd. 90 sq. l. 1348 sq. rd. $\div 16 =$ 84 sq. ch. 4 sq. rd. 84 sq. ch. $\div 10 = 8$A., 4 sq. ch.
Ans. 8 A. 4 sq. ch. 4 sq. rd. 90 sq. l.

16 25,373,896 sq. l. $\div 625 = 40{,}598$ sq. rd. 146 sq. l. 40,598 sq. rd. $\div 16 = 2537$ sq. ch. 6 sq. rd. 2537 sq. ch. $\div 10 = 253$ A. 7 sq. ch. Ans. 253 A. 7 sq. ch. 6 sq. rd. 146 sq. l.

17 98,754 sq. rd. $\div 16 = 6172$ sq. ch. 2 sq. rd. 6172 sq. ch. $\div 10$ $= 617$ A. 2 sq. ch. Ans. 617 A. 2 sq. ch. 2 sq. rd.

18 9857 sq. ch.÷10=985 A. 7 sq. ch. 985 A.÷640=1 sq. mi. 345 A. Ans. 1 sq. mi. 345 A. 7 sq. ch.

19 75,328 sq. rds.÷16=4708 sq. ch.,÷10=470 A. 8 sq. ch.

20 46 ch.×37 ch.=1702 sq. ch. 42 A. $5\frac{1}{2}$ sq. ch.=$425\frac{1}{2}$ sq. ch. $1702-425\frac{1}{2}=1277\frac{1}{2}$ sq. ch. $1277\frac{1}{2}\div1702=\frac{3}{4}$

21 5 ch.×100=500 l.,×25=12,500 sq. l.,÷100,000=$\frac{1}{8}$ A. lost. 12 A.−$\frac{1}{8}$ A.=$11\frac{7}{8}$A. $11\frac{7}{8}\div12=\frac{95}{96}$ cultivated.

22 S. 5 ch.+S. 3 ch=S. 8 ch. ∴ Must measure north the same distance. 1st rectangle=10.6 ch.×5 ch.= 53 sq. ch. 2nd rectangle=5.3 ch.× 3 ch.=15.9 sq. ch.
53 sq. ch.+15.9 sq. ch.=68.9 sq. ch.,÷10=6.89 A.

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3 234.56 m.×184.25 m.,=43,217.68 sq. m.,÷100=432.1768 ares

4 6 m. sq.=36 sq. m. 36 sq. m.−6 sq. m.=30 sq. m.

5 160 A.÷ 2.47=64.777327 ha.,×100=6477.7327 ares.

CARPETING AND PLASTERING

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1 $15\frac{3}{4}$ ft.÷$\frac{3}{4}$ yd.=7 breadths. 17 ft.÷3=$5\frac{2}{3}$ yds. $5\frac{2}{3}$ yds.×7 =$39\frac{2}{3}$ yds.

2 $33\frac{1}{3}$ ft.÷3=$7\frac{1}{3}$ yds., or 8 br'dths. $17\frac{1}{2}$ ft.÷3=$5\frac{5}{6}$ yds. 8×$5\frac{5}{6}$ yds. =$46\frac{2}{3}$ yds. crosswise. $17\frac{1}{2}$ ft.÷3=$5\frac{5}{6}$ yds., or 6 breadths., ×$7\frac{7}{9}$ yds.=$46\frac{2}{3}$ yds. lengthwise.

3 11 ft.=$3\frac{2}{3}$ yds.; 15 ft. =5 yds. 5÷$\frac{3}{4}$=$6\frac{2}{3}$, or 7 breadths,× $3\frac{2}{3}$=$25\frac{2}{3}$ yds. crosswise. $3\frac{2}{3}\div\frac{3}{4}$=5 breadths,×5=25 yds. lengthwise.

4 24 ft. ÷ 3 = 8 breadths. $\frac{1}{8}$ of 8 = 1 yd. for matching. 19 ft. ÷ 3 = $6\frac{1}{3}$ yds., × 8 + 1 yd. = $51\frac{2}{3}$ yds., × \$1.25 = \$64.58$\frac{1}{3}$.

5 $13\frac{1}{2}$ ft. ÷ $\frac{3}{4}$ yds. = 6 breadths. $\frac{1}{4} \times 6 = 1\frac{1}{2}$ yds. for matching. 18 ft. ÷ 3 = 6 yds. 6 yds. × 6 + $1\frac{1}{2}$ yds. = $37\frac{1}{2}$ yds., × \$2.75 = \$103.12$\frac{1}{2}$.

6 (18 ft. + 20 ft.) × 10 ft. × 2 = 760 sq. ft., sides.
18 ft. × 20 ft. = 360 sq. ft., ceiling.
1120 sq. ft., sides and ceiling.

6 ft. × 2 ft. × 2 = 18 sq. ft., windows.
7 ft. × 3 ft. = 21 sq. ft., door.
57 sq. ft. ÷ 2 = 28.5 sq. ft., allowance.

1120 sq. ft. − 28.5 sq. ft. = 1091.5 sq. ft. ÷ 9 = 121.277 sq. yds., × \$.27 = \$32.74$\frac{1}{2}$.

7 (11 ft. + 12 ft.) × 12 ft. × 2 = 552 sq. ft., sides.
11 ft. × 12 ft. = 132 sq. ft., ceiling.
684 sq. ft., sides and ceiling.

6 ft. × $2\frac{1}{2}$ ft. = 15 sq. ft., window.
7 ft. × $2\frac{2}{3}$ ft. = $18\frac{2}{3}$ sq. ft., door.
$33\frac{2}{3}$ sq. ft. ÷ 2 = $16\frac{5}{6}$ sq. ft.

684 sq. ft. (s. and c.) − $16\frac{5}{6}$ sq. ft. (allowance) = $667\frac{1}{6}$ sq. ft.
$667\frac{1}{6}$ sq. ft. × 17 = 11,$341\frac{5}{6}$ sq. ft. ÷ 9 = 1260$\frac{1}{4}$ sq. yds.

8 (90 ft. + 65 ft.) × 24 ft. × 2 = 7440 sq. ft., sides.
90 ft. × 65 ft. = 5850 sq. ft., ceiling.
11,290 sq. ft.

10 ft. × 3 ft. × 13 = 390 sq. ft., windows.
9 ft. × 4 ft. × 4 = 144 sq. ft., doors.
534 ft. ÷ 2 = 267 sq. ft.

13,290 sq. ft, − 267 sq. ft. = 13,023 sq. ft., ÷ 9 = 1447 sq. yds.

9 (16 ft. + 24 ft.) × 9 ft. × 2 = 593 sq. ft., sides.
16 ft. × 24 ft. = 384 sq. ft., ceiling.

1104 sq. ft., ÷ 9 − 12 = $110\frac{2}{3}$ sq. yds.

10 ($24\frac{1}{2}$ ft. + $15\frac{1}{2}$ ft.) × 10 ft. × 2 = 795 sq. ft., sides.
$24\frac{1}{4}$ ft. × $15\frac{1}{4}$ ft. = $373\frac{5}{8}$ sq. ft., ceiling

$1168\frac{5}{8}$ sq. ft. ÷ 9 − 14 sq. yds. =
$115\frac{6}{72}$ sq. yds., × \$.30 = \$34.75

11 (18 ft. + 15 ft.) × 10 ft. × 2 = 660 sq. ft., ÷ 9 = $73\frac{1}{3}$ sq. yds. − 20 sq. yds. = $53\frac{1}{3}$ sq. yds. $53\frac{1}{3} \div (8 \times \frac{2}{3}) = 10$ rolls, × \$.95 = \$9.50

12 ($17\frac{1}{2}$ ft. + $24\frac{2}{3}$ ft.) × 10 ft. × 2 = $843\frac{1}{3}$ sq. ft., sides.
$17\frac{1}{2}$ ft. × $24\frac{2}{3}$ ft. = $431\frac{2}{3}$ sq. ft., ceiling.

1275 sq. ft. ÷ 9 − 50 sq. yds. = $91\frac{2}{3}$ sq. yds. × \$.33 = \$30.25

13 $843\frac{1}{3}$ sq. ft., sides ÷ 9 = $93\frac{12}{27}$ sq. yds. − 50 sq. yds. = $43\frac{12}{27}$ sq. yds. $8 \times \frac{18}{36} = 4$ sq. yds. in a roll. $43\frac{12}{27} \div 4 = 10\frac{25}{27}$ rolls, × \$.75 = \$8.19.

14 30 ft. × 25 ft. × 2 = 1500 sq. ft., × 144 = 216,000 sq. in.
216,000 sq. in. ÷ (5 in. × 4 in.) = 108,000 sh'gles ÷ 1000 = 10.8 M.

15 $100\frac{1}{3}$ ft. × 4 ft. ÷ (8 in. × 4 in. ÷ 144) = 1806 bricks.

16 16 in. × 24 in. × 840 ÷ 144 = 2240 sq. ft.

17 (18 ft. + 16 ft.) × 12 ft. × 2 = 816 sq. ft., sides.
18 ft. × 16 ft. = 288 sq. ft., ceiling.

1104 sq. ft., sides and ceiling

8 ft. × $2\frac{2}{3}$ ft. × 2 ÷ 2 = 32 sq. ft., windows.
8 ft. × 3 ft. × 2 ÷ 2 = 24 sq. ft., doors.

56 sq. ft. allowance

1104 sq. ft. − 56 sq. ft. = 1048 sq. ft., ÷ 9 = $116\frac{4}{9}$ sq. yds., × \$.37½ = \$43.66⅔.

18 3 ft. $\times$ $1\frac{1}{2}$ ft. $\times 2 = 4$ sq. ft. both sides; 4 ft. $\times$ $1\frac{1}{2}$ ft. $= 2\frac{2}{3}$ sq. ft. top. 4 sq ft. $+ 2\frac{2}{3}$ sq. ft. $= 6\frac{2}{3}$ sq. ft. $\times 144 \div (4 \times 4) = 60$ tiles.

SOLID MEASURE

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1 $17\frac{1}{2} \times 14 \times 12 = 2940$ cu. ft., $\div 27 = 108\frac{8}{9}$ cu. yds.

2 $18 \times 12 \times 9\frac{1}{4} = 1889$ cu. ft., $\div 128 = 15\frac{89}{128}$ cords.

12 $9 \times 4 \div 144 \times 24 = 6$ cu. ft.

16 $1\frac{3}{4}$ c. yds. $\times 27 + 11$ cu. ft. $= 332$ cu. ft., $\times 1728 = 625{,}536$ cu. in.

17 9 cu. yds. $\times 27 + 4$ cu. ft. $= 247$ cu. ft., $\times 1728 + 13$ cu. in. $=$ 426,829 cu. in.

18 159,728 cu. in. $\div 1728 = 92$ cu. ft. 752 cu. in. 92 cu. ft. $\div 27 =$ 3 cu. yds. 11 cu. ft. Ans. 3 cu. yds. 11 cu. ft. 11 cu. ft. 752 cu. in.

19 9 cu. ft. $\times 1728 + 828$ cu. in. $= 1638$ cu. in. 7 cu. ft. $\times 1728 +$ 932 cu. in. $= 13{,}028$ cu. in. 16,380 cu. in. $+ 13.028$ cu. in. $=$ 29,408 cu. in.

20 $12 \times 11 \times 9 = 1188$ cu. ft., $\div 27 = 44$ cu. yds.

21 30 in. $\times 24$ in. $\times 2$ in. $= 1440$ cu. in.

22 27×175 lbs. $= 4725$ lbs.

23 7 ft. $\times 9$ ft. $\times 7$ ft. $= 441$ cu. ft., $\times 1728 = 762{,}048$ cu. in.

24 128 cu. ft. $\times 1\frac{1}{2} = 192$ cu. ft., $\div (3\frac{1}{2}$ ft. $\times 5$ ft.$) = 10\frac{3}{35}$ ft.

25 7 ft. $\times 7$ ft. $\times 7$ ft. $= 343$ cu. ft., $\div 27 = 12$ cu. yds. 19 cu. ft.

26 ft. $\times 4\frac{1}{2}$ ft. $\times 6$ ft. $= 1512$ cu. ft., $\div 128$ cu. ft. $= 11\frac{3}{16}$ cords.

27 16 ft. $\times 4\frac{1}{3}$ ft. $\times 7\frac{1}{2}$ ft. $= 520$ cu. ft., $\div 128$ cu. ft. $= 4\frac{1}{16}$ cords., $\times$ \$6.50 = \$26.41.

28 247 cu. ft. $\div 27 = 9\frac{2}{27}$ cu. yds.

29 63 ft. $\times 157$ ft. $\times 8$ ft. $= 79{,}128$ cu. ft., $\div 27 = 2930\frac{2}{3}$ cu. yds.

30 (150 ft. $\times 60$ ft. $\div 2) \times 9$ ft. $= 40{,}500$ cu. ft., $\div 128$ cu. ft. $= 316\frac{1}{2}\frac{3}{2}$ cords, $\times$ \$9.60 = \$3005.86.

31 20 cu. ft. $\times 1728 + 432$ cu. in. $= 34{,}992$ cu. in., $\div 46{,}656$ cu. in. $= 75$ cu. yds.

32 216 cu. in. $\div 1728 = .125$ cu. ft.

33 648 cu. in. $\div 46{,}656 = \frac{1}{72}$ cu. yd.

34 .75 cu. yd. $\times 46{,}656 = 34{,}992$ cu. in.

35 .975 cu. yd. $\times 46{,}656 = 45{,}489.6$ cu. in., $\div 1728 = 26$ cu. ft. 561.6 cu. in.

36 .375 cds. $\times 128 = 48$ cu. ft.

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3 28.5 steres. $\times .276 = 7.866$ cds.

4 7.2 m. $\times 1.7$ m. $\times 2$ m. $= 24.48$ cu. m. or steres. 24.48 steres $\times .276 = 6.75648$ cds.

STONE AND LUMBER

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1 (22 ft. + 45 ft.) × 8 ft. × $1\frac{1}{2}$ ft. × 2 = 1608 cu. ft. ÷ $16\frac{1}{2}$ = $97\frac{5}{11}$ perch, × $5.25 = $511.64.

2 (30 ft. + 45 ft.) × 20 ft. × 1 ft. × 2 = 3000 cu. ft. 7 ft. × $2\frac{1}{2}$ ft. × 1 ft. × 10 = 175 cu. ft.; 3 ft. × 8 ft. × 1 ft. × 4 = 96 cu. ft.; 175 cu. ft. + 96 cu. ft. = 271 cu. ft. 3000 cu. ft. − 271 cu. ft. = 2729 cu. ft., × 21 = 57,309 bricks.

3 (58 ft. × 25 ft.) × 44 ft. = 7304 sq. ft. 8 ft. × 3 ft. × 29 = 696 sq. ft. 7304 sq. ft. − 696 sq. ft., = 6608 sq. ft., × $1\frac{1}{2}$ ft. = 9912 cu. ft. × 21 = 208,152 bricks ÷ 1000 = 208.157 M., × $4 = $832.61.

4 (9 rds. + 7 rds.) × 2 × $16\frac{1}{2}$ × 5 ft. × $1\frac{1}{2}$ ft. = 3960 cu. ft. = 3960 cu. ft. ÷ $16\frac{1}{2}$ = 240 perches.

5 40 rds × 4 = 160 rds. × $16\frac{1}{2}$ × 4 ft. × 2 ft. ÷ $16\frac{1}{2}$ = 1280 perches.

6 (46 ft. + 34 ft.) × 2 = 160 ft. × 20 ft. = 3200 sq. ft. 8 ft. × 3 ft. × 12 = 288 sq. ft.; $7\frac{2}{3}$ ft. × $3\frac{1}{4}$ ft. × 6 = $149\frac{1}{2}$ sq. ft.; 288 sq. ft. + $149\frac{1}{2}$ sq. ft. = $437\frac{1}{2}$ sq. ft. 3200 sq. ft. − $437\frac{1}{2}$ sq. ft. = $2762\frac{1}{2}$ sq. ft. (surface) × $1\frac{1}{2}$ ft. = $4143\frac{3}{4}$ cu. ft. × 21 = 87,018$\frac{3}{4}$ bricks.

7 14 × $1\frac{1}{3}$ = $18\frac{2}{3}$ ft., × $.07$\frac{1}{2}$ = $1.40.

8 $\frac{1}{2}$ of 16 + 11 = $13\frac{1}{2}$, average width. $13\frac{1}{2}$ × 15 ÷ 12 = $16\frac{7}{8}$ ft.

9 $30\frac{1}{4}$ × 8 × 8 ÷ 12 = $162\frac{2}{3}$ ft.

10 40 × 14 × 11 ÷ 1000 = .513$\frac{1}{3}$ M. × $32.50 = $16.684.

11 9 × 12 × 14 × 3 ÷ 12 = 378 ft. ÷ 1000 = .378 M., × $40 = $15.12

12 $45 \times 18 \times 2 \times 4 \div 12 = 540$ ft.

13 $328 \times 12 \times 8 \div 12 = 2624$ ft., $\div 1000 = 2.624$ M., $\times \$24 = \$62.98 -$

14 $12 \times 8 \times 1 \div 12 = 8$ ft.

15 $24 \times 10 \times 1 = 240$ ft.

16 $8 \times 14 \times 10 \times 3 \div 12 = 280$ ft.

17 $50 \times 12 \times 1 = 600$ ft.

18 $10 \times 18 \times 4 \times 6 \div 12 = 360$ ft.

19 $8 \times 18 \times 16 \times 2 \div 12 = 384$ ft.

20 $11 \times (18 + 11) \div 2 \times 1 = 13\frac{7}{24}$ ft.

21 $2 \times 19 \times 15 \times 15 \div 12 = 712\frac{1}{2}$ ft.

LIQUID MEASURE

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13 1 bbl. $\times 31\frac{1}{2} \times 4 + 2$ qts. $= 128$ qts., $\times 2 + 1$ pt. $= 257$ pts.

14 5 bbls. $\times 31\frac{1}{2} \times 4 + 6$ qts. $= 636$ qts.

15 1 bbl. $\times 31\frac{1}{2} \times 4 = 126$ qts., $\times 2 = 252$ pts.

16 5 bbls. $\times 31\frac{1}{2} \times 4 + 2$ qts. $= 632$ qts, $\times 2 + 1$ pt. $= 1265$ pts.

17 2 gals. $\times 4 + 1$ qt. $= 9$ qts., $\times 2 \times 1$ pt. $= 19$ pts.

18 $\frac{1}{2}$ bbl. $\times 31\frac{1}{2} \times 4 + 3$ qts. $= 66$ qts.

19 1 bbl. $\times 31\frac{1}{2} \times \frac{1}{4}$ gal., $= 31\frac{3}{4}$ gals., $\times 4 + 1$ qt. $= 127$ qts., $\times 2 =$ 1 pt. $= 255$ pts.

20 7856 qts $\div 4 = 1964$ gals., $\div 31\frac{1}{2} = 62$ bbls. 11 gals

21 9563 pts. $\div 2 = 4781$ qts. 1 pt. 4781 qts. $\div 4 = 1195$ gals. 1 qt. 1195 gals. $\div 31\frac{1}{2} = 37$ bbls. 39 gals. Ans. 37 bbls. 39 gals. 3 qts. 1 pt.

22 9543 qts. $\div 4 = 2385$ gals. 3 qts. 2385 gals. $\div 31\frac{1}{2} = 75$ bbls. 22 gals. 2 qts. 75 bbls. 22 gals. 2 qts. + 3 qts. = 75 bbls. 23 gals. 1 qt.

23 86543 pts. $\div 2 = 43271$ qts. 1 pt. 43271 qts. $\div 4 = 10417$ gals. 3 qts. 10417 gals. $\div 31\frac{1}{2} = 343$ bbls. 12 gals. 2 qts., + 3 qts. 1 pt. = 343 bbls. 13 gals. 1 qt. 1 pt.

24 6754 gals. $\div 31\frac{1}{2} = 214$ bbls. 13 gals.

25 16 gals. $\times$ $4 \times 2 = 128$ pts.

26 2 bbls. $\times 31\frac{1}{2} + 4$ gals. $= 67$ gals., $\times 4 + 2$ qts. $= 270$ qts., $\times 2$ + 1 pt. $= 541$ pts., $\times \$.05 = \$27.05$

27

41 gals.	3 qts.	$1\frac{1}{2}$ pts.
25 "	7 "	1 "
9 "	3 "	$1\frac{1}{2}$ "
78 gals.	3 qts.	

$78\frac{3}{4}$ gals. $\times \$.75 = \$59.06$

28

73 gals.	3 qts.
60 "	2 "
40 "	1 "
65 "	2 "
240 gals.	

240 gals. $\times \$.17 = \$40.80$

29 150,000 gals. $\div 5 = 30{,}000$ cans., $\times \$1.75 = \$52{,}500.$

30 4 gals. 1 pt. $= 33$ pts. 1 bbl. $= 252$ pts. $33 \div 252 = \frac{11}{84}$ bbls.

31 75 bbls. $\times 252 = 189$ pts. $\div 2 = 94$ qts. 1 pt. 94 qts. $\div 4 = 23$ gals. 2 qts. Ans. 23 gals. 2 qts. 1 pt.

32 $\frac{2}{3}$ bbls. $\times 252 = 168$ pts. 13 gals. 1 pt. $= 105$ pts. $105 \div 168 = \frac{5}{8}$ bbl.

33 $\frac{1}{4}$ of (16 gals. 2 qts.) $= 33$ qts. $1\frac{1}{2}$ bbls. $\times 31\frac{1}{2} \times 4 = 189$ qts. $33 + 189 = 11\frac{1}{3}$.

34 $\frac{3}{4}$ gal. $\div 31\frac{1}{2} = \frac{1}{42} = .0238$ bbl.

35 .375 bbl. $\times 31\frac{1}{2} = 11.8125$ gals., $\times 4 = 47.25$ qts

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4 2.75 m. $\times$ 1.82 m. $\times$ 1.12 m. $= 560.56$ cu. m., $\times 10 = 5605.6$ cu. dm., li., or kg.

5 5605.6×1.057 qts. $= 5925.1192$ qts., $\div 4 = 1481.2798$ gals
5605.6×2.2 lbs. $= 12332.32$ lbs.

WEIGHTS

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39 5 oz. $\times 20 + 5$ pwt. $= 105$ pwt. $105 \div 240 = \frac{7}{16}$ lb

40 $\frac{9}{20}$ of $\frac{45}{100}$ lb. $= \frac{81}{400} = .2025$ lb.

41 .08 lb. $\times 12 = 96$ oz., $\times 20 = 19\frac{1}{5}$ pwt.

43 4 oz. $\times 20 + 10$ pwt. $= 90$ pwt., $\div 240 = .375$ lb.

44 2 cen. $\times 100 + \frac{15}{16}$ lb. $= 200\frac{15}{16}$ lbs. $200\frac{15}{16}$ lbs. $\div 2000$ lbs. $= \frac{6443}{64000}$ T.

45 3 cen. $\times 100 + \frac{1}{2}$ lb. $= 300\frac{1}{2}$ lbs. $300\frac{1}{2}$ lbs. $\div 2000$ lbs. $= .15025$ T.

46 $\frac{5}{12}$ T. × 20 = $8\frac{1}{3}$ cwt. $\frac{1}{3}$ cwt. × 100 = $33\frac{1}{3}$ lbs. $\frac{1}{3}$ lb. × 16 = $5\frac{1}{3}$ oz.
Ans. 8 cen., 33 lbs., $5\frac{1}{3}$ oz.

47 .075 T. × 20 = 1.5 cwt. .5 cwt. × 100 = 50 lbs. Ans. 1 cwt. 50 lbs.

48 $\frac{1}{2}$ of $2\frac{1}{2}$ T. = $\frac{5}{4}$ T. $\frac{7}{15} \div \frac{5}{4} = \frac{28}{75}$ T.

49 .065 T. = $\frac{13}{200}$ T. ÷ 3 = $\frac{13}{600}$ T.

50 17 cwt. × 100 ÷ 50 lbs. = 1750 lbs., ÷ 200 = .875 T.

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3 434.28 grains × 15.4 grs. = 6687.912 grains, ÷ 24 = 278 pwt.
15.912 gr. = 278 pwt. ÷ 20 = 13 oz. 18 pwt.
Ans. 1 lb. 1 oz. 18 pwt. 15.912 gr.
6687.912 gr. ÷ 437 5 gr. = 15 oz. 125.412 grs. Av

4 74,625,837 grains ÷ 1000 = 74,625.837 li.

5 1 bbl. × $31\frac{1}{2}$ × 4 = 126 qts. ÷ 1.057 qts. = 119.20 + li.

6 87.5 m. × 115 m. × .015 m. = 1509.375 cu. m., × 1000 = 1,509,375 cu. dm., or li.

CIRCULAR MEASURE

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9 29° × 60 + 35′ = 1775′. × 60 + 26″ = 106,526″

10 943,767″ ÷ 60 = 15,729′ 25″. 15,729′ ÷ 60 = 262° 9′
Ans. 262° 9′ 25″

11 $\frac{7}{8}$ of 45° = $16\frac{7}{8}$°. $\frac{7}{8}$° × 60 = $52\frac{1}{2}$′. $\frac{1}{2}$′ × 60 = 30″ Ans. 16° 52′ 30″

12 1 quad = 90°, × 60 × 60 = 324,000″. 25″ ÷ 324,000″ = $\frac{1}{12960}$ quad.

13 $\frac{1}{20} \div 3 = \frac{1}{80}$ Ans.

14 .32 quad. $\div 4 = .08$ circum.

15 5° 2′ 3″ = 18,123″; 1° 40′ 41″ = 6041″ $6041 \div 18{,}123 = \frac{1}{3}$.

16 9° 3′ 28″ = 33,948″; 25° 3′ 28″ = 90,208″. $33{,}948 \div 90{,}208 = .3763$

17 $\frac{1}{5}$ of 22° 50′ = 274′; 9° 8′ = 548′. $274' \div 548' = \frac{1}{2}$.

18 $.125° \times 60 = 7.5'$. $.5' \times 60 = 30''$. Ans. 7′ 30″

TIME

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10 1 day 2 hrs. 40 min. 20 sec. $\div 2$ = 13 hrs. 20 min. 10 sec.

11 2 min. 35 sec. $\times 3$ = 7 min. 45 sec.

12 6×4 wks. = 24 wks. $6 \times \$3 = \$18$ weekly income, $- \$5 = \$13$. $24 \times \$13 = \$312$.

13 5 hrs. $\times 60 + 15$ min. = 315 min., $\times 60 + 25$ sec. = 18,925 sec.

14 2 yrs. $\times 365 + 11$ days = 741 days, $\times 24 = 17{,}784$ hrs., $\times 60 +$ 12 min. = 1,067,052 min.

15 3 yrs. $\times 365 + 37$ da. = 1132 da., $\times 24 + 16$ hrs. = 27,184 hrs., $\times$ $60 + 24$ min. = 1,631,064 min., $\times 60 + 13$ sec. = 97,863,853 sec.

16 58,967,379 sec. $\div 60 = 982{,}789$ min. 39 sec.; 982,789 min. $\div 60$ $= 16{,}379$ hrs. 49 min.; 16,379 hrs. $\div 24 = 682$ days 11 hours 682 da. $\div 365 = 1$ yr. 317 da. Ans. 1 yr. 317 da. 11 hrs. 49 min. 39 sec.

17 47,675 min. ÷ 60 = 794 hrs. 35 min.; 794 hrs. ÷ 24 = 33 da. 2 hrs. Ans. 33 days 2 hrs. 35 min.

18 427,329 sec. ÷ 60 = 7122 min. 9 sec.; 7122 min. ÷ 60 = 118 hrs. 42 min.; 118 hrs. ÷ 24 = 4 da. 22 hrs. Ans. 4 da. 22 hrs. 42 min. 9 sec.

19 157,540 min. ÷ 60 = 2625 hrs. 40 min.; 2625 hrs. ÷ 24 = 109 da. 9 hrs. Ans. 109 da. 9 hrs. 40 min.

20 8,567,983 sec. ÷ 60 = 142,799 min. 43 sec.; 142,799 min. ÷ 60 = 2379 hrs. 59 min.; 2379 hrs. ÷ 24 = 99 da. 3 hrs.
Ans. 99 da. 3 hrs. 59 min. 43 sec.

21 1 da. 6 hrs. 15 min. minus 21 hrs. 25 min. = 8 hrs. 50 min. 8 hrs. × 60 + 50 min. = 530 min.

22 1 da. 5 hrs. 8 min. 16 sec. minus 15 hrs. 9 min. 25 sec. = 13 hrs. 42 min. 19 sec.

23 5 yrs. × 365 da. = 1825 da. 1825 × 25 min. = 45625 min., ÷ 60 = 760 hrs. 25 min. 760 hrs. ÷ 24 = 31 da. 16 hrs. Ans. (without leap year day) = 31 da. 16 hrs. 25 min.

24 6 mo. × 20 da. = 120 school da., × (25¼ min. × 2 trips) × 2 (return trips) = 12,120 min., ÷ 60 = 202 hrs.

25 $\frac{5}{6}$ yr. × 365 = 304$\frac{1}{6}$ da. $\frac{1}{6}$ da. × 24 = 4 hrs. Ans. 304 da. 4 hrs.

26 1 da. = 86,400 sec., 2 hrs. × 60 + 30 min. = 150 min., × 60 + 45 sec. = 9045 sec. 9045 ÷ 86,400 = $\frac{67}{640}$ da.

27 6 da. × 24 + 15 hrs. = 159 hrs., × 60 + 40 min. = 9580 min., × 60 + 36 sec. = 574,836 sec.; 3 da. × 24 + 7 hrs. = 79 hrs., × 60 + 50 min. = 4790 min., × 60 + 18 sec. = 287,418 sec.
287,418 ÷ 574,836 = $\frac{1}{2}$.

28 .075 × 24 = 1.8 hrs. .8 hr. × 60 = 48 min. Ans. 1 hr. 48 min.
.625 wk. × 7 = 4.37$\frac{1}{2}$ da. $\frac{5}{8}$ da. × 24 = 9 hrs. Ans. 4 da. 9 hrs.
.378 yr. × 365 = 137.97 da. .97 da. × 24 = 23.28 hrs. .28 hr. × 60 = 16.8 min. .8 min. × 60 = 48 sec. Ans. 137 da. 23 hrs. 16 min. 48 sec.

29 1 wk. = 168 hrs. 2 da. × 24 + 18 hrs. = 66 hrs.
66 ÷ 168 = $\frac{11}{28}$ wk.

30 .58 yr. × 365 = 211.7 da. .7 da. × 24 = 16.8 hrs. .8 hr. × 60 = 48 min. Ans. 211 da. 16 hrs. 48 min.

31 34 da. × 24 + 14 hrs. = 830 hrs., × 60 + 6 min. = 49,806 min., × 60 + 24 sec. = 2,988,384 sec. 4 da. × 24 + 7 hrs. = 103 hrs., × 60 + 45 min. = 6205 min., × 60 + 48 sec. = 372,348 sec.
372,348 ÷ 2,988,384 = .125

32 .975 yr. × 365 = 355.875 da. .875 da. × 24 = 21 hrs.
Ans. 355 da. 21 hrs.

33 .125 yr. × 365 = 45.625 da. .625 da. × 24 = 15 hrs.
Ans. 45 da. 15 hrs.

34 1 mo. = 720 hrs. 22 da. × 24 + 12 hrs. = 540 hrs.
540 ÷ 720 = $\frac{3}{4}$ mo.

35 1 mo. = 2,592,000 sec. 2 hrs. × 60 + 40 min. = 160 min., × 60 + 36 sec. = 9636 sec. $9636 \div 2{,}592{,}000 = \frac{803}{216000}$ mo.

36 1 wk. = 10,080 min. 11 hrs. × 60 + 33 min. = 693 min. $693 \div 10{,}080 = \frac{11}{160}$ wk.

37 1 da. = 86,400 sec. 31 min. × 60 + 30 sec. = 1890 sec. $1890 \div 86{,}400 = \frac{7}{320}$ da.

38 4.655 yr. .655 yr. × 365 = 239.075 da. .075 da. × 24 = 1.8 hr. .8 hr. × 60 = 48 min. Ans. 4 yr. 239 da. 1 hr. 48 min.

39 1 wk. = 168 hrs. 3 da. × 24 + 3 hrs. = 75 hrs.
$75 \div 168 = .4464+$ wk.

40 6 mo. × 30 + 9 da. = 189 da., × 24 + 13 hrs. = 4349 hrs., × 60 + 35 min. = 272,965 min., × 60 = 16,377,900 sec.; 2 mos. × 30 + 3 da. = 63 da., × 24 + 4 hrs. = 1516 hrs., × 60 + 28 min. = 90,988 min., × 60 + 28 sec. = 5,459,308 sec.
$5{,}459{,}308 \div 1{,}637{,}790 = .333+$

41 12 da. × 24 + 1 hr. = 289 hrs., × 60 × 60 = 1,040,400 sec.
3 hrs. × 60 + 37 min. = 217 min., × 60 + 1 sec. = 13,021 sec.
$13{,}021 \div 1{,}040{,}400 = .0125+$.

LONGITUDE AND TIME

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8 2 hrs. 25 min. 6 sec., × 15 = 30° 16′ 30″

9 1 " 24 " 16 " × 15 = 21° 4′ 0″

10 3 " 14 " 28 " × 15 = 48° 37′ 0″

11 5 hrs. 13 min. 12 sec., $\times 15 = 78° 18' 0''$

12 4 " 8 " 12 " $\times 15 = 62° 3' 0''$

13 17 " 9 " 14 , $\times 15 = 257° 18' 30''$
$360° - (257° 18' 30'') = 102° 41' 30''$

14 15 hrs. 14 min. 13 sec., $\times 15 = 228° 33' 15''$
$360° - (228° 33' 15'') = 131° 26' 45''$

15 $122° 24' 15'' - 93° 56' = 29° 19' 15'' \div 15 = 1$ hr. 57 min. 17 sec.

16 $90° 5' - 74° 3'' = 16° 4' 57'', \div 15 = 1$ hr. 4 min. $19\frac{4}{5}$ sec.

17 $72° 53' - 13° 23' 53'' = 59° 29' 7'', \div 15 = 3$ hrs. 57 min. $56\frac{7}{15}$ sec.

18 $122° 24' 15'' - 74° 3'' = 48° 24' 12''. \div 15 = 3$ hrs. 13 min. $36\frac{4}{5}$ sec.

19 $87° 37' 30'' + 30° 18' = 117° 55' 30'', \div 15 = 7$ hrs. 51 min. 42 sec.

20 $99° 5' - 90° 15' 16'' = 8° 49' 44'', \div 15 = 35$ min. $18\frac{4}{15}$ sec.

21 $84° 26' - 77° 2' 48'' = 7° 23' 12'', \div 15 = 29$ min. $32\frac{4}{5}$ sec.

22 $166° 28' 54''$ E $+ 73° 34'$ W $= 190° 2' 54''$
$360° - 190° 2' 54'' = 169° 57' 6'' \div 15 = 11$ hrs. 19 min. $48\frac{2}{5}$ sec.

23 $122° 24' 15'' + 2° 20' 22'' = 124° 44' 37'', \div 15 = 8$ hrs. 18 min. $58\frac{7}{15}$ sec. P. M.

24 $71° 3' 30''$ W. $+ 116° 28' 54'' = 187° 32' 24'', \div 15 = 12$ hrs. 30 min. $9\frac{3}{5}$ sec. 6 P. M. + 12 hrs. 30 min. $9\frac{3}{5}$ sec. = 6 hrs. 30 min. $9\frac{3}{5}$ sec. A. M. next day.

25 $30° 18' - 2° 20' 22'' = 27° 57' 38'', \div 15 = 1$ hr. 51 min. $50\frac{8}{15}$ sec. A. M. next day.

26 10 hrs. 30 min. – 7 hrs. 20 min. = 3 hrs. 10 min., × 15 = 47° 30′.
47° 30′ + 121° 26′ = 168° 56′ W.
14 hrs. 25 min. – 10 hrs. 30 min. = 3 hrs. 55 min. × 15 – 58° 45′. 121° 26′ – 58° 45′ – 62° 41′ E.
13 hrs. 10 min. – 10 hrs. 30 min. = 2 hrs. 40 min., × 15 = 40°.
121° 26′ – 40° = 81° 26′ W.
10 hrs. 30 min. – 5 hrs. 15 min., = 5 hrs. 15 min., × 15 = 78° 45′, + 121° 26′ = 200° 11′. 360° – 200° 11′ = 159° 49′ E.

27 15 hrs. 30 min. – 7 hrs. 30′ = 8 hrs., × 15 = 120°.
120° – 73° 32′ = 46° 28′ E.

28 26 hrs. – 16 hrs. = 10 hrs., × 15 = 150°.
150° + 2° 20′ 22″ = 152° 20′ 22″ E.

29 25 hrs. 25 min. – 13 hrs. 25 min. = 12 hrs., × 15 = 180°.
180° – 71° 3′ 30″ = 108° 56′ 30″ E.

30 18 hrs. 30 min – 9 hrs. 25 min. = 9 hrs. 5 min., × 15 = 136° 150
136° 15′ – 2° 20′ 22″ = 133° 54′ 38″ W.

31 8 hrs. 15 min. – 7 hrs. 30 min. = 45 min., :: 15 = 11° 15′.
95° 56′ – 11° 15′ = 84° 41′ W.

32 26 hrs. 15 min. – 23 hrs. 45 min. = 2 hrs. 30 min., × 16 = 37° 30′.
73° 34′ – 37° 30′ = 36° 4′ W.

33 5 hrs. 5 min. $21\frac{2}{3}$ sec., × 15 = 76° 20′ 25″. 76° 20′ 25″ – 2° 20′ 22″ = 74° 3″ W. = New York.

34 6 min. $6\frac{1}{2}$ sec., × 15 = 1° 31′ $37\frac{1}{2}$″, + 71° 3′ 30″ = 72° 35′ $7\frac{1}{2}$″ W.

35 122° 24′ 15″ − 74° 3″ = 48° 24′ 12″, ÷ 15 = 3 hrs. 13 min. $36\frac{4}{5}$ sec.
3 A.M. + 3 hrs. 13 min. $36\frac{4}{5}$ sec. = 13 min. $36\frac{4}{5}$ sec. past 6 A.M.

36 37 min. × 15 = 9° 15′. 74° 3″ − 9° 15′ = 64° 45′ 3″ W.

37 11:25 P. M. − 5:20 P. M. = 6 hrs. 5 min., × 15 = 91° 15′.
91° 15′ − 30° 18 = 60° 57′ W.

ADDITION OF COMPOUND NUMBERS

194 Page 158

1

	69 rds.	$2\frac{1}{2}$ yds.		
1 mi.	14	2	2 ft.	3 in.
	16	0	0	9
	25	0	11	0
1 mi.	125 rds.	3 yds.	2 ft.	0 in.

2

7 yds.	2 ft.		
5	$1\frac{1}{4}$		
0	2	$9\frac{1}{2}$ in.	
3	1	$6\frac{1}{2}$	
$4\frac{1}{2}$	$2\frac{3}{4}$		
$22\frac{1}{2}$ yds.	1 ft.	4 in. =	
22 yds.	1 ft.	10 in.	

3

25 yds.	1 ft	9 in	
32	1	8	
35	6	4	
7	2	11	
0	9	0	
106 yds.	0	8 = 19 rds.	1 yd. 2 ft. 2 in.

4

23 mi.	118 rds.	0 yds.	14 ft.	
19	137	0	11	
8	0	0	62	8 in.
23	147	0	0	6
0	9	0	0	7
74 mi.	96 rds.	2 yds.	0 ft.	3 in.

5

22 rds.	2 yds.	2 ft.	0 in.
18	4	2	0
22	6	1	0
16	0	4	3
80 rds.	4yds.	0 ft.	3 in.

6

7 mi.	59 rds.	0 yds.	6 ft.	7 in.
8	96	0	7	8
5	9	0	0	8
26	87	0	8	3
46 mi.	252 rds.	$1\frac{1}{2}$ yds.	2 ft.	2 in. =
46 mi.	252 rds.	2 yds.	0 ft.	8 in.

7

71 mi.	23 rds.	$4\frac{1}{2}$ yds.	0 ft.	0 in.
9	17	2	$2\frac{1}{2}$	0
23	0	3	0	9
103 mi.	41 rds.	4 yds.	$2\frac{1}{2}$ ft.	9 in. =
103 mi.	41 rds.	5 yds.	0 ft.	3 in.

8

$1\frac{1}{2}$ yds.	0 ft.	3 in.
0	2	4
0	$3\frac{1}{4}$	0
$2\frac{1}{2}$ yds.	$2\frac{1}{4}$ ft.	7 in. =
3	1	4

9

$\frac{1}{2}$ yd. =	0 yd.	1 ft.	6 in.
	0	0	3
	2	2	3
	3 yds.	1 ft.	

10

$\frac{3}{4}$ mi. =	240 rds.	0 yd.	0 ft.	0 in.
$\frac{1}{2}$ rd. =	0	2	2	3
$\frac{1}{2}$ yd. =			1	6
$\frac{3}{4}$ ft. =			0	9
	240 rds.	3 yds.	1 ft.	6 in.

11

79 chs.	3 rds.	16 l.
65	2	11
33	2	6
46	1	13
75	0	2
3 mi. 60 chs.	1 rd.	23 l.

12

75 A.	4 sq. rds.	9 sq. yds.	0 sq. ft.	72 sq. in.
27	48	18	0	92
7	100	29	8	139
		7	0	129
109 A.	154 sq. rds.	$2\frac{1}{2}$ sq. yds.	2 sq. ft.	0 sq. in. =
109 A.	154 sq. rds.	3 sq. yds.	6 sq. ft.	72 sq. in.

13 $\frac{1}{2}$ A. = 80 sq. rds. $\frac{5}{9}$ sq. yds. = 5 sq. ft.

Ans. 80 sq. rds. 5 sq. ft.

14

$\frac{3}{5}$ A. =	96 sq. rds.	0 sq. yd.	0 sq. ft.
$\frac{4}{9}$ sq. rd. =		13	4
$\frac{2}{3}$ sq. yd. =			6
	96 sq. rds.	14 sq. yds.	1 sq. ft.

15

5 cds.	7 cd. ft.	0 cu. ft.
2	2	12
$7\frac{3}{8}$	6	15
3	0	2
$19\frac{3}{8}$ cds.	0 cd. ft.	13 cu. ft. =
19 cds.	3 cd. ft.	13 cu. ft.

16

95 cu. yds.	26 cu. ft.	985 cu. in.
87	19	876
98	3	875
281 cu. yds.	$22\frac{7}{12}$ cu. ft.	

17

29 gals.	2 qts.	1 pt.
16	3	0
0	11	1
49 gals.	1 qt.	197 qts., × \$.16 = \$19.70.

18 5825 pts. + 4285 pts. + 3426 pts. = 13,536 pts.

13,536 pts. ÷ 2 = 6768 qts., × \$$\frac{1}{8}$ = \$846.

6768 qts. ÷ 8 = 846 pks., ÷ 4 = $211\frac{1}{2}$ bu.

19

1 bu	0 pk	4 qts.	1 pt.
	2	3	1
		27	1
2 bu.	2 pks.	3 qts.	1 pt. = $83\frac{1}{2}$ qts.

$83\frac{1}{2}$ qts. × $\$\frac{1}{8}$ = \$10.44.

20

9 hrs.	15 min.
8	20
11	0
10	35
9	45
6	50

$55\frac{3}{4}$ hrs., × \$.35 = \$19.51¼.

21

2 gr.	1 doz	3 units.
	3	20
3	5	4
5 gr.	11 doz.	3 units.

22

2 bdls.	1 rm.	3 qrs.	0 shts.
3	0	0	17
1	0	1	0
6 bdls.	1 rm.	4 qrs.	17 shts. = 6353 shts.

23

£ 6	17 s.	5 d.
7	11	4
9	7	3
£ 23	16 s.	0 d. = £ $23\frac{4}{5}$, × \$4.86 = \$115.67.

24 50 cts. + 10 cts. + $137\frac{1}{2}$ cts. + 95 cts. + 25 cts. = \$3.17¼.

25

14 T.	13 cwt.	75 lbs.
25	12	26
2	5	14
17	16	29
60 T.	7 cwt.	44 lbs.

26

84 T.	12 cwt.	74 lbs.	6 ozs.
23	12	26	8
51	16	45	15
81	5	4	7
241 T.	6 cwt.	51 lbs.	4 ozs.

27

5 lbs.	9 oz.	14 pwt.
3	7	13
2	4	11
11 lb.	9 oz.	18 pwt.

SUBTRACTION OF COMPOUND NUMBERS.

195. Page 160

1

25 A.	74 sq. rds.
74	40
12	117
112 A.	71 sq. rds.

160 A. − 112 A. 71 sq. rds. = 47 A. 89 sq. rds.

2

7 mi.	25 rds.	3 yds.	4 ft.	
3	110	4	2	
3 mi.	234 rds.	$4\frac{1}{2}$ yds.	2 ft. =	
3 mi.	234 rds.	5 yds.	0 ft.	6 in.

3 (14 chs. 43 l.) × (17 chs. 25 l.) = $248.91\frac{3}{4}$ chs.

(8 chs. 11 l.) = 15 chs. = 121.65 chs.

$248.91\frac{3}{4}$ chs. − 121.65 chs. = 12 A. $7.26\frac{3}{4}$ chs.

4

48 cu. yds.	12 cu. ft.	1236 cu. in.
28	24	1500
19 cu. yds.	14 cu. ft.	1464 cu. in.

5

4 gals.	2 qts.	0 pt.
1	3	1
2 gals.	2 qts.	1 pt.

6 $31\frac{1}{2}$ gals. + 30 gals. 1 qt. = 61 gals. 3 qt.

6 gals.	2 qts.
5	3
5	2
7	3
28	0

53 gals. 2 qts. = $53\frac{1}{2}$ gals., × \$.27 = \$14.44½

61 gals. 3 qts. − 53 gals. 2 qts. = 8 gals. 1 qt.

7 cwt.	0 lb.	11 oz.
6	37	7
13 cwt.	39 lbs.	2 oz.
11	79	8
1 cwt.	59 lbs.	10 oz.

8 .625 lb. × 12 = 7.50 oz. − 4.25 oz. = 3.25 oz.

9 $\frac{1}{12}$ of 72 lbs. 12 oz. = 6 lbs. 1 oz.

100 lbs. − 6 lbs. 1 oz. = 93 lbs. 15 oz.

10

1 lb.	2 oz.	5 pwt.	0 gr.
	11	17	18
	2 oz.	7 pwt.	6 gr.

11

2 lbs.	0 oz.	0 dr.	0 sc.	0 gr.
	9	1	2	7
1 lb.	2 oz.	6 dr.	0 sc.	13 gr.

12

5 yrs.	2 mos.	2 wks.	1 da.	7 hrs
3	3	0	4	3
2 yrs.	2 mos.	1 wk.	4 da.	4 hrs.

13

3 mos.	0 wks.	0 da.	0 hrs.	0 min.	0 sec.
	2	4	8	19	29
2 mos.	1 wk.	2 da.	15 hrs.	40 min.	31 sec.

14 31 Jan. + 28 Feb. + 31 Mar. + 30 Apr. + 31 May + 30 June = 181 days. 6 Dec. + 31 Jan. + 28 Feb. + 31 Mar. + 30 Apr. + 31 May + 30 June + 4 July = 191 da., − 181 da. = 10 da. Ans.

15 2 wks. $3\frac{5}{6}$ da. $-$ .659 wk. $=$ 1 wk. 6 da. 5 hrs. 17 min. 16.8 sec.

16 \$40.25 + \$21.375 + \$70.50 + \$11.64 + \$7.50 + \$8.25 + \$16 + \$38 + \$85.914 + \$107.393 = \$406.822. \$729 − 406.822 = \$322.178.

17 $\frac{2}{3}$ of $3\frac{1}{4}$ mi. $= 1\frac{3}{4}$ mi. $+ 17\frac{1}{7}$ rds. $= 314\frac{2}{7}$ rds.
$314\frac{2}{7}$ rds. $- 120\frac{1}{3}$ rds. $= 193$ rds. 5 yds. $8\frac{4}{7}$ in.

18 184 da. $-$ 180 da. $=$ 4 da., $\times 24 = 96$ hrs. $\times 60 = 5760$ min., $\times 60 =$ 345,600 sec.

19

Sec. $\div 3 =$	32 yrs.	3 mos.	3 wks.	0 da.	17 hrs.	24 min.	$5\frac{1}{3}$ sec.
Fst. $\times 4 =$	12	2	1	6	12	48	28
	20 yrs.	1 mo.	1 wk.	1 da.	4 hrs.	35 min.	$37\frac{1}{3}$ sec.

20

$\frac{3}{4}$ of First $=$	6 T.	12 cwt.	$18\frac{9}{16}$ lbs
.25 T. $=$		5	
	6 T.	7 cwt.	$18\frac{9}{16}$ lbs.

21 $\frac{2}{16}$ sq. rds. $= 5\frac{1}{2}$ sq. yds., $- \frac{3}{4}$ sq. yd. $= 4\frac{3}{4}$ sq. yds.

22

£ 48	17 s.	6 d.	2 far.
39	14	9	3
£ 9	2 s.	8 d.	3 far.

23 55° 58′ 40″ − 34° 22′ = 21° 36′ 40″

24 $\frac{8}{40}$ lb. $\times 12 = \frac{9}{10}$ oz., $\times 20 = 18$ pwt.
5 lbs. 4 oz. 8 pwt. − 18 pwt. $=$ 5 lbs. 3 oz. 10 pwt.

25 £ $\frac{5}{9} = 11$ s. $1\frac{1}{3}$ d. $\frac{2}{3}$ of $\frac{3}{4}$ s. $= 6$ d. 11 s. $1\frac{1}{3}$ d. $- 6$ d. $= 10$ s. $7\frac{1}{3}$ d.

26 46 ft. $\times$ 46 ft. $= 2116$ sq. ft., $-$ 46 sq. ft. $= 2070$ sq. ft.

MULTIPLICATION OF COMPOUND NUMBERS

196 Page 161

1 5 mi. 28 rds. 3 yds. 2 ft. 11 in.
9
45 mi. 258 rds. 2 yds. 2 ft. 3 in.

2 79 chs. 3 rds. 23 l.
7
6 mi. 79 chs. 3 rds. 11 l.

3 158 sq. rds. 270 sq. yds. 7 sq. ft. 138 sq. in.
11
10 A. 148 sq. rds. 4 sq. yds. 2 sq. ft. 6 sq. in.

4 98 cds. 13 cu. ft. 758 cu. in.
13
1275 cds. 46 cu. ft. 1214 cu. in.

5 5 bbls. 29 gals. 3 qts.
23
136 bbls. $22\frac{1}{2}$ gals. 1 qt. =
136 bbls. 22 gals. 3 qt.

6 7 oz. 17 pwt. 23 gr.
96
63 lbs. 2 oz. 4 pwt. 0 gr.

7 75 cwt. 15 oz. × 274 = 1027 T. 12 cwt. 56 lbs. 14 oz.

8 9 yrs. 7 mos. 3 wks. 5 da. 19 hrs. 35 min. 28 sec
63
608 yrs. 9 mos. 1 wk. 2 da. 10 hrs. 14 min. 24 sec.

9 17 rds. 3 yds. $2\frac{1}{3}$ ft.
4
70 rds. 4 yds. 0 ft. 4 in.

10 7 cwt. 29 lbs. 4 oz.
· 9

3 tons 5 cwt. 29 lbs. 4 oz. = 6563½ lbs.
6563½ × $.09½ = $623.51.

11 5 mi. 19 rds. 4 yds.
54

273 mi. 105 rds. 1 yd. 1 ft. 6 in.

12 13 × 365 + 3 days = 4748 days, × $.25 = $1187.
4748 pts. ÷ 2 = 2374 qts., ÷ 4 = 593 gals. 2 qts.
593 gals. ÷ 31½ = 18 bbls. 26 gals. Ans. 18 bbls. 26 gals. 2 qts.

13 $1.25 × 12 × 13 = $195 cost of milk. $1187 − 195 × $992.

14 $1375 ÷ $125 = 11. 5 A. 24 sq. rds. 19 sq. yds. 7 sq. ft
11

56 A. 111 sq. rds. 5¼ sq. yds. 5 sq. ft.
56 A. 111 sq. rds. 5 sq. yds. 7 sq. ft. 36 sq. in.

15 5 pwt. 6 gr. × 17 = 4 oz. 9 pwt. 6 gr.

DIVISION OF COMPOUND NUMBERS

197 Page 162

1 9) 9 mi. 78 rds. 4 yds. 2 ft. 8 in.
1 mi. 8 rds. 4 yd. 0 ft. 7⅔ in.

2 6) 68 chs. 2 rds. 24 l.
11 chs. 1 rd. 20⅔ l.

3 16) 296 sq. rds. 29 sq. yds. 8 sq. ft. 98 sq. in.
18 sq. rds. 16 sq. yds. 8 sq. ft. 141⅛ sq. in.

4 28) 97 cds. 11 cu. ft. 979 cu. in.
3 cds. 59 cu. ft. $1454\frac{11}{28}$ cu. in.

5 19) 23 bbls. 28 gals. 5 qts.
1 bbl. 8 gals. 0 qts. $1\frac{5}{19}$ pts.

6 15) 56 lbs. 11 oz. 19 pwt. 21 gr.
3 lbs. 9 oz. 11 pwt. $23\frac{4}{5}$ gr.

7 95) 87 cwt. 0 lb. 13 oz.
0 cwt. 91 lbs. $9\frac{2}{5}$ oz.

8 17) 24 yrs. 11 mos. 2 wks. 3 days 11 hrs. 47 min.
1 yr. 5 mos. 2 wks. 3 days 11 hrs. 59 min. $14\frac{3}{17}$ sec.

9 20,600 lbs. $\div 294 = 70\frac{10}{147}$ lbs.

10 340 lbs. 11 oz. $\div (2 \times 54) = 6$ lbs. $4\frac{17}{18}$ ozs.

11 6 mi. sq. $= 36$ sq. mi., $\times 640 = 23{,}040$ A.
23,040 A. $\div 62 = 371$ A. 6 sq. chs. 2 sq. rds. $40\frac{10}{31}$ sq. l.

12 39 sq. rds. $\times 30\frac{1}{4} + 2$ sq. yds. $= 1181\frac{3}{4}$ sq. yds., $\times 9 + 6$ sq. ft. $=$
$10{,}641\frac{3}{4}$ sq. ft., $\times 144 + 128$ sq. in. $= 1{,}532{,}540$ sq. in.
11 rds. $\times 16\frac{1}{2} + 2$ ft. $= 183\frac{1}{2}$ ft., $\times 12 + 8$ in. $= 2210$ in.
1,532,540 sq. in. $\div 2210$ in. $= 693\frac{10}{221}$ in., width.
$693\frac{10}{221}$ in. $= 3$ rds. 2 yds. 2 ft. $3\frac{10}{221}$ in. Ans.

13 120 cu. yds. 5 cu. ft. $\div (5 \times 4) = 6$ cu. yds. 432 cu. in. or 162 cu. ft. 432 cu. in.

14 2 gals. $\times 4 + 3$ qts. $= 11$ qts., $\times 2 + 1$ pt. $= 23$ pts.
23 pts. $\times 2 = 46$ half pts.

15 5280 ft. $\div 30 = 176$, $\times 2 = 352$ rails.

REVIEW OF COMPOUND NUMBERS

198 Page 163

1 2 hrs. 55 min. = 175 min. $175 \times 59 \times 4\frac{5}{11}$ ft. = 45,602$\frac{1}{11}$ ft. 45,602$\frac{1}{11}$ ft. ÷ 5280 = 8 mi. 3362$\frac{1}{11}$ ft. 3362$\frac{1}{11}$ ft. ÷ 3 = 1120 yds. 2$\frac{1}{11}$ ft. 1120 yds. ÷ $5\frac{1}{2}$ = 203 rds. $3\frac{1}{2}$ yds. 8 mi. 203 rds. $3\frac{1}{2}$ yds. 2$\frac{1}{11}$ ft. = 8 mi. 203 rds. 4 yds. 7 in.

2 1 mi. 8 rds. = 328 rds., × $16\frac{1}{2}$ = 5412 ft. 5412 ft. × 3 ft. × 2 ft. = 32,472 cu. ft. 32,472 cu. ft. ÷ 27 = 1202 cu. yds. 18 cu. ft.

2 **Metric.** 1649.58 m. × .914 m. × 609 m. = 918.19911708 cu. m. or steres. 918.19911708 steres × 1.308 cu. yd. = 1201.004 cu. yd.

3 855.95 ÷ 1.50 = 570 cwt. $63\frac{1}{3}$ lbs.

4 11 min. 45 sec. = 705 sec. 11 hrs. = 39,600 sec. 39,600 ÷ 705 = $56\frac{8}{47}$ mi.

4 **Metric.** 1609.34 m. × $56\frac{8}{47}$ = 90,396.97.

5 3 ft. 2 in. = 38 in.; 2 ft. 10 in. = 34 in.; 38 in. × 34 in. × 5 in. = 6460 cu. in. 1 ft. 4 in. = 16 in.; 3 ft. = 36 in. 16 in. × 36 in. × 5 in. = 2880 cu. in. 6460 cu. in. + 2880 cu. in = 9340 cu. in., ÷ 1728 = 5 cu. ft. 700 cu. in.

5 **Metric.** .965 m. × .863 m. × .127 m. = .105764965 cu. m. .406 m. × .91 m. × 127 m. = .04692142 cu. m. .105764965 cu. m. + .04692142 cu. m. = .152686385 cu. m.

6 3 ft. × $2\frac{1}{3}$ ft. × 2 = 14 sq. ft. $2\frac{1}{3}$ ft. × 1 × 2 = $4\frac{2}{3}$ sq. ft. 3 ft. × 1 ft. × 2 = 6 sq. ft. 14 sq. ft. + $4\frac{2}{3}$ sq. ft. + 6 sq. ft. = $24\frac{2}{3}$ sq. ft., surface of second block. 4 ft. × 4 ft. × 6 = 96 sq. ft., surface of first block. 96 sq. ft. + $24\frac{2}{3}$ sq. ft. = $120\frac{2}{3}$ sq. ft.

7 640 A. × 160 = 102,400 sq. rds., × $30\frac{1}{4}$ = 3,097,600 sq. yds., × 9 = 27,878,400 sq. ft., × 144 = 4,014,489,600 sq. in.

7 **Metric.** 640 A. ÷ 2.47 A. = 259.10921 hectares.

8 16 ft. × 5 ft. × $3\frac{1}{2}$ ft. = 280 cu. ft., ÷ 128 = $2\frac{3}{16}$ cd.

8 **Metric.** 4.87 m. × 1.06 m. × 1.52 m. = 7.846544 cu. m. or steres

9 $9\frac{3}{4}$ A. × 160 = 1560 sq. rds., ÷ 260 = 6 rds.

10 16 pwt. 11 grs. = 395 grs. 5 lbs. 1 pwt. 11 grs. = 28,835 grs. 28,835 ÷ 395 = 73.

10 **Metric.** 1872.4 gr. ÷ 25.649 gr. = 73 spoon, (23 gr. remaining).

11

7 yrs.	0 mo.	0 wks.	0 da.	0 hrs.	0 min.	0 sec.
	1	2	3	11	35	42
6 yrs.	10 mos.	1 wk.	3 da.	12 hrs.	24 min.	18 sec.

12 (480 rds. + 330 rds.) × 2 = 1620 rds., × $16\frac{1}{2}$ = 26,730 ft., ÷ $24\frac{3}{4}$ = 108. 108 posts × \$.12½ = \$135.

13 1620 (rds.) × 3 × $1\frac{1}{2}$ lbs. = 7290 lbs., × \$.05½ = \$400.95.

14 32 gals. × \$.17 = \$5.44 cost.
32 gals. − (.06¼ × 32) = 30 gals. 15 gals. × \$.29 = \$4.35; 5 gals. × \$.27 = \$1.35. $8\frac{3}{4}$ gals. × \$.26 = \$2.27½; $1\frac{1}{4}$ gals. × \$.28 = \$.35.
\$4.35 + \$1.35 + \$2.27½ + \$.35 = \$8.32½. selling price
\$8.32½ S. P. − \$5.44 C. = \$2.88½ profit.

15 660 ft. ÷ 5280 ft. = $\frac{1}{8}$ = .125 mi.

16 4 × \$31.75 = \$127. \$127 + \$175 + \$17.50 + \$18.42 = \$337.92.
\$337.92 ÷ \$1.50 = 225.28 centals.

17 $9\frac{1}{4}$ cd. $+ 7\frac{1}{2}$ cd. $= 16\frac{3}{4}$ cd., $\times 128 = 2144$ cu. ft. 8964 cu. ft. $-$ 2144 cu. ft. $= 6820$ cu. ft. 6820 cu. ft. $\div 128 = 53\frac{9}{32}$ cd. $53\frac{9}{32}$ cd. $\times \$7.25 = \$386.29$.

17 Metric. 33.514492 steres $+$ 27.173913 steres $= 60.688405$ steres. 253.736413 steres $-$ 60.688405 steres $= 193.048008$ steres. 193.048008 steres. $\times \$2.001 = \$386.289$.

18 7 mi. 148 rd. $\times 365 = 2723\frac{1}{16}$ mi.

18 Metric. 1609.372 m. $\times 365 = 587{,}420.78$ m.

19

$\frac{4}{5}$ lb. $=$	9 oz.	12 pwt.	0 gr.
$4\frac{5}{8}$ oz. $=$	4	16	16
$31\frac{1}{3}$ pwt. $=$	0	31	8
1 lb.	4 oz.	0 pwt.	0 gr.

1 lb. 4 oz. $-$ 11 pwt. 3 gr. $=$ 1 lb. 3 oz. 8 pwt. 21 gr.

20 2 lb. $\times 12 + 6$ oz. $= 30$ oz., $\times 20 + 17$ pwt. $= 617$ pwt., $\times 24 + 12$ gr. $= 14{,}820$ gr. $\div 25.8, = \$574.41$.

20 Metric. 961.5584 grs. $\div 1.6753$ grs. $= \$573.96$.

21 320 rds. $\div 12 = 26\frac{2}{3}$ rds. to block, $\times 16\frac{1}{2} = 440$ rds. 6 yds. $2\frac{1}{2}$ cu. ft. $\times 440 = 2680$ cu. yds. 20 cu. ft.

22 6 gals. $\times 8 = 48$ pts. $\times 9 = 432$ pts. 35 pts. $+ 96$ pts. $+ 276$ pts. $+ 11\frac{1}{2}$ pts. $= 13\frac{1}{2}$ pts. $= 6$ qts. $1\frac{1}{2}$ pts.

23 $16\frac{1}{2}$ ft. $\times 5\frac{1}{2}$ ft. $\times 1$ ft. $= 90.75$ cu. ft.

24 10×43560 sq. ft. $= 435{,}600$ sq. ft., $\times \frac{3}{4} = 326{,}700 \div (45 \times 150 = 6750) = 48\frac{3}{5}$ lots.

25 $24 \times (11 \text{ pwt. } 3 \text{ gr.}) = 264 \text{ pwt. } 552 \text{ gr.} = 14\frac{7}{20} \text{ oz.}, \times \$1.60 = \$22.96.$

25 **Metric.** $24 \times 18.636 \text{ gr.} = 447.264 \text{ gr.}, \div 31.168 \text{ gr.} = 14.35$ spoons, $\times \$.50 = \$7.17\frac{1}{2}$.

26 $98 \text{ bbl.} \times 31\frac{1}{2} \text{ gal.} = 3087 \text{ gal.}, \times (6 - 4) = 1543\frac{1}{2} \text{ min.}$

$1543\frac{1}{2} \text{ min.} = 1 \text{ da. } 1 \text{ hr. } 43 \text{ min. } 30 \text{ sec.}$

27 Quarter Section. $= 160 \text{ A.} \times 160 = 25{,}600 \text{ sq. rd.} - (17 \times 17 \text{ sq. rd.}) = 25{,}311 \text{ sq. rd.} = 158 \text{ A. } 31 \text{ sq. rd.}$

28 $15 \text{ ft.} \div 8 \text{ ft.} = 1\frac{7}{8} \text{ cd.}, \times \$9.75 = \$18.28.$

29 $8\frac{1}{4} \text{ ft.} \div 3 \text{ ft.} = 2\frac{3}{4} \text{ ft.}$ $5280 \text{ ft.} \div 8\frac{1}{4} = 640$ revolutions of large wheel. $640 \times 2\frac{3}{4} = 1760$ revolutions small wheel.

$1760 - 640 = 1120$ times.

30

$\frac{1}{2}$ A. = 80 sq. rd.	0 sq. yd.	0 sq. ft.	0 sq. in.
79	7	6	98
	$22\frac{1}{4}$ sq. yd.	2 sq. ft.	46 sq. in. =
	22 sq. yd.	4 sq. ft.	82 sq. in.

31 $27 \text{ ft.} = 9 \text{ yd.}, \div \frac{3}{4} = 12$ strips. $12 \text{ ft.} = 4\frac{3}{3} \text{ yds.}$

$12 \times 4\frac{3}{4} \text{ yds.} = 56 \text{ yds.}$

32 $(15 \text{ ft.} + 11\frac{1}{4} \text{ ft.}) \times 9 \text{ ft.} \times 2 = 472\frac{1}{2}$ sq. ft. sides.
$15 \text{ ft.} \times 11\frac{1}{4} \text{ ft.} = 168\frac{3}{4}$ sq. ft. ceiling.

$641\frac{1}{4}$ sq. ft. sides and ceiling.
$6\frac{2}{3} \text{ ft.} \times 3 \times 2 = 40$ sq. ft. doors.
$2\frac{1}{6} \text{ ft.} \times 6 \times 3 = 39$ sq. ft. windows.

$79 \div 2 = 39\frac{1}{2}$ sq. ft. allowance.
$641\frac{1}{4} \text{ sq. ft.} - 39\frac{1}{2} \text{ sq. ft.} = 601\frac{3}{4}$ sq. ft., $\div 9 = 66\frac{3}{36}$ yds.
$66\frac{3}{36} \text{ yds.} \times \$.32 = \$21.395.$

33 $9\frac{1}{4}$ ft. $\times 6\frac{1}{3}$ ft. $\times 4\frac{3}{4}$ ft. $= 278\frac{1}{4}\frac{3}{6}$ cu. ft.

34 $\frac{1}{2}$ of First = 1 A. 79 sq. rd. 21 sq. yd. 8 sq. ft. 13 sq. in.
100 24 7 96

138 sq. rd. $27\frac{1}{4}$ sq. yd. 0 sq. ft. 61 sq. in.

= 138 sq. rd. 27 sq. yd. 2 sq. ft. 99 sq. in.

35 118° 18′ 00′ Los Angeles.
87 37 30 Chicago.

15)30° 40′ 30″

2 hrs. 2 min. 42 sec.

10 hrs. − 2 hrs. 2 min. 42 sec. = 7 hrs. 57 min. 18 sec. A. M.

36 58° 22′ W.
18 28 E.

15) 76° 50′

5 hrs. 7 min. 20 sec.
6 hrs. 30 min.

11 hrs. 37 min. 20 sec. A. M.

37 $9 \times 24 = .375$

38 $\frac{5}{8}$ mi. = 200 rd. 0 ft. 0 in.
$\frac{1}{3}$ rd. = 0 5 6
$\frac{5}{6}$ ft. = 0 0 10

200 rds. 6 ft. 4 in.

38 Metric. 1005.84 m. + 1.67 m. + .25 m. = 1007.76 m. Ans.

39 7 ft. $\times$ 4 ft. = 28 sq. ft. 105 cu. ft. $\div$ 28 sq. ft. = $3\frac{3}{4}$ ft.

40 (16 ft. + 22 ft.) $\times 2\frac{5}{6}$ ft. $\times 2 = 215\frac{1}{3}$ sq. ft.

$41\frac{1}{12}$ ft. $\times 2\frac{5}{6}$ ft. $\times 3 = 41\frac{1}{24}\frac{9}{4}$ sq. ft. $215\frac{1}{3}$ sq. ft. $- 41\frac{1}{24}\frac{9}{4}$ sq. ft. =

$173\frac{1}{2}\frac{3}{4}$ sq. ft., $\times$ \$.06 = \$10.41$\frac{1}{4}$.

41 $\frac{2}{3}^{2}$ yds. $\div \frac{3}{4} = 9\frac{7}{9} = 10$ strips. 18 ft. = 6 yds. 10×6 yds. = 60 yds.

41 **Metric.** 5.48 m. × 6.70 m. = 36.716 sq. m. ÷ .68 m. = 53.994 m.

42 11 ft. 11 in. = $\frac{121}{360}$ yd. = $3\frac{13}{360}$ yd. = 4 strips.
17 ft. 10 in. = $\frac{107}{180}$ yd. $\frac{107}{180}$ yd. × 4 = $23\frac{7}{90}$ yd.

43 60 ft. = 20 yd. 80 ft. = $26\frac{2}{3}$ yd. 24 ft. = 8 yd. 20 ft. = $6\frac{2}{3}$ yd. 36 ft. = 12 yd. 20 strips × $36\frac{2}{3}$ yd. = $533\frac{1}{3}$ yds. 8 strips × $6\frac{2}{3}$ yd. = $53\frac{1}{3}$ yd. 12 strips × $6\frac{2}{3}$ yd. = 80 yds. $533\frac{1}{3}$ yd. + 10 yd. + $53\frac{1}{3}$ yd. + 80 yd. = $676\frac{2}{3}$ yd., × \$1.50 = \$1015.

44 2 × 170 lb. = 340 lb. × 12 = 4080 oz. \$3700 ÷ 4080 = \$.906.

45 26 ft. − 2 ft. (border) = 24 ft. = 8 yd. 8 yd. ÷ $\frac{3}{4}$ yd. = 11 strips.
17 ft. − 2 ft. (border) = 15 ft. = 5 yds. × 11 + $\frac{11}{16}$ matching = $55\frac{11}{16}$ yds. (26 ft. + 17 ft.) × 2 = 86 ft. = $28\frac{2}{3}$ yds. edging.
$55\frac{11}{16}$ yds. + $28\frac{2}{3}$ yds. = $84\frac{17}{48}$ yds. × \$1.95 = \$209.04.

46 1 mi. = 1760 yd. $\frac{176}{211}\frac{0}{2} = \frac{5}{6}$.

47 $\frac{4}{5}$ of .225 mi. = .18 mi. × 320 = $57\frac{3}{5}$ rd. $\frac{3}{5}$ rd. × $16\frac{1}{2} = 9\frac{9}{10}$ ft.
$\frac{9}{10}$ ft. × 12 = $10\frac{4}{5}$ in. Ans. 57 rd. 9 ft. $10\frac{4}{5}$ in.

48 $\frac{12}{49}$ cd. ft. ÷ 8 = $\frac{3}{98}$ cd.

49 (22 ft. + 16 ft.) × 9 ft. × 2 = 684 sq. ft., ÷ 9 = 76 sq. yd. − 20 sq. yd. = 56 sq. yd. 8 yd. × $1\frac{1}{2}$ ft. = 4 sq. yd. to roll.
56 sq. yd. ÷ 4 sq. yd. = 14 rolls, × \$.87$\frac{1}{2}$ = \$12.25.

50 2 T. 7 cwt. 28 lb. = 4728 lb. 5 cwt. 91 lb. = 591 lb.
591 ÷ 4728 = $\frac{1}{8}$.

51 396 sq. rd. 21 sq. yd. = 2 A. 76 sq. rd. 21 sq. yd. = $2\frac{58}{121}$ A. ×
\$605 − \$1500 Offered. 16 × \$175 = \$2800 Received.
\$2800 − \$1500 = \$1300. 360 ft. ÷ 8 = 45 ft. wide.

UNITED STATES MONEY

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22 $\$16 \div \frac{1}{16} = 256$ lb.

23 $\$48.75 \div \frac{5}{4} = 39$ books.

24 $874 \times \frac{1}{16} = \$54.62\frac{1}{2}$.

25 $\$16 \div \frac{1}{4} = 64$ lbs.

26 $84 \times \frac{1}{8} = \$10.50$.

27 $648 \times \frac{1}{8} = \$81.00$.

28 $\$19 \div \frac{1}{8} = 152$ lb.

29 $976 \times \frac{3}{4} = \$732$.

30 $879 \times 1\frac{2}{5} = \$1230.60$.

31 $\$40 \div \frac{7}{8} = 45\frac{5}{7}$ yd.

32 $\$9\frac{1}{3} \div \$\frac{2}{3} = 14$ chickens.

33 $376 \times \$\frac{3}{8} = \$141$.

34 $\$32 \div \frac{1}{16} = 512$ bags.

35 $\$357 \div 12\frac{3}{4} = 28$ T.

36 $7212 \times \frac{1}{12} = \$601$.

37 $18 \times 1\frac{1}{4} = \$22.50$.

38 $189 \times \$\frac{1}{3} = \$63$.

39 $\$26\frac{7}{8} \div \frac{5}{8} = 43$ lbs.

40 $\$95 \div \$4\frac{3}{4} = 20$ sheep.

41 $408 \times \$1\frac{7}{8} = \$765$.

42 $248 \times \$1\frac{5}{8} = \$403$.

43 $100 \div \frac{7}{8} = 114\frac{2}{7}$ rolls.

44 $249 \times \$2\frac{2}{3} = \$664$.

45 $726 \times \$\frac{5}{6} = \$605$.

46 97.856 M. × $19 = 1859.264.

47 785.469 M. × $8 = $6283.75.

48 98.56 cwt. × $6 = $591.36.

49 7643.98 cwt. × $2⅔ = $18,345.55.

50 439.86 cwt. × $.70 = $307.90.

51 $95 ÷ $1¼ = 76 cwt.

52 75.43 cwt. × $2½ = $188.575.

53 98,756 lb. = 49.378 T., × $12 = $592.54.

54 8 ÷ 12 = ⅔. ⅔ of 2000 lb. = 1333⅓ lb.

55 1975 lb. + 1125 lb. + 1240 lb. = 4340 lb.
4340 lb. ÷ 2000 = 2.17 T., × $12¾ = $27.67.

56 1 lb. Troy = 5760 gr. 25.8 gr. − ($\frac{1}{10}$ of 25.8) = 23.22 gr.
5760 ÷ 23.22 gr. = 248\frac{8}{129}$.

57 (412.5 gr. − $\frac{1}{10}$ of 412.5 gr.) = 371¼ gr.
5760 gr. ÷ 371¼ gr. = $15.52.

58 7 lb. × 12 + 11 oz. = 95 oz., × 20 + 18 pwt. = 1918 pwt., × 24 + 3 gr. = 46,035 gr., ÷ 371¼ gr. = $124.

59 1 lb. = 12 oz., × 20 + 1 pwt. = 241 pwt., × 24 + 21 gr. = 5805 gr.
5805 gr. ÷ 23.22 gr. = $250.

60 2 lb. × 12 = 24 oz., × 20 + 3 pwt. = 483 pwt., × 24 + 18 gr. = 11,610 gr. 11,610 gr. ÷ 23.22 gr. = $500, ÷ 10 = 50 eagles.

61 6 lb. × 12 = 72 oz., × 20 + 6 pwt. = 1446 pwt. × 24 + 18 gr. = 34,722 gr. $\frac{1}{2}$ of 385.8 − $\frac{1}{10}$ of 192.9 = 173.61 gr.
34,722 gr. ÷ 173.61 gr. = 200 half dollars.

62 1 lb. × 12 + 6 oz. = 18 oz., × 20 + 1 pwt. = 361 pwt., × 24 + 16$\frac{1}{2}$ gr. = 8680$\frac{1}{2}$ gr. $\frac{1}{4}$ of 385.8 − $\frac{1}{10}$ of 96.45 = 86.805 gr.
8680.5 gr. ÷ 86.805 gr. = 100 quarters.

63 3 lb. × 12 = 36 oz., × 20 + 3 pwt. = 723 pwt., × 24 + 9 gr. = 17,361 gr. $\frac{1}{10}$ of 385.8 gr. − $\frac{1}{10}$ of 38.58 gr. = 34.722 gr.
17,361 gr. ÷ 34.722 gr. = 500 dimes.

64 9 lb. × 12 + 2 oz. = 110 oz., × 20 + 8 pwt. = 2208 pwt., × 24 = 52,992 gr. 52,992 gr. × .975 = 51,667.2 gr. pure silver.
51,667.2 gr. ÷ 173.61 gr. = 297.6 half dollars.

65 3 lb. × 12 + 8 oz. = 44 oz., × 20 + 11 pwt. = 891 pwt., × 24 = 213,840 gr. 2$\frac{1}{2}$ × 258 gr. − $\frac{1}{10}$ of 64.50 = 58.05 gr.
213,840 gr. ÷ 58.05 gr. = 368$\frac{16}{43}$ pieces.

GENERAL ANALYSIS

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1 18 : 30 :: 45 : (75); or, $\frac{45}{18}$ × 30 = $75.

2 15 : 7 :: 15 : (7); or, 15 × $\frac{7}{15}$ = 7 days.

3 48 : 84 :: 108 : (189); or, $\frac{108}{48}$ × 84 = $189.

4 24 : 22 :: 564 : (517); or, $\frac{564}{24}$ × 22 = 517 mi.

5 160 : 175 :: 96 : (105); or, $\frac{96}{160}$ × 175 = 105 T.

6 $50 : 18 :: 75 : (27)$; or, $\frac{75}{50} \times 18 = 27$ A.

7 $112.50 : 90 :: 50 : (40)$; or, $\frac{50}{112.50} \times 90 = 40$ chairs.

8 $8\frac{3}{4} : 12\frac{1}{2} :: 17.50 : (25)$; or, $17.50 \times \frac{4}{35} \times \frac{25}{2} = \$25$.

9 $78 : 58\frac{1}{2} :: 12 : (9)$, or, $\frac{12}{78} \times \frac{117}{2} = 9$ men.

10 $24 : 32 :: 18 : (24)$; or, $18 \times \frac{32}{24} = 24$ men.

11 $18 : 42 :: 61.20 : (142.80)$; or, $\frac{61.20}{18} \times 42 = \$142.80$.

12 $30 : 100 :: 3.75 : (12.50)$; or, $\frac{3.75}{30} \times 100 = \$12.50$.

13 $12 : 10 :: 14 : (11\frac{2}{3})$; or, $14 \times \frac{10}{12} = 11\frac{2}{3}$ days.

14 $12 : 22 :: 486 : (891)$; or, $\frac{486}{12} \times 22 = \$891$.

15 $486 : 891 :: 12 : (22)$; or, $\frac{12}{486} \times 891 = 22$ cows.

16 $44\frac{1}{3} : 33\frac{1}{4} :: 9\frac{1}{2} : (7\frac{1}{8})$; or, $\frac{19}{4} \times \frac{133}{532} \times \frac{171}{24} = 7\frac{1}{8}$ yds.

17 $\left.\begin{matrix} 12 : 15 \\ 480 : 300 \end{matrix}\right\} :: 720 : (562.50)$; or, $720 \times \frac{12}{15} \times \frac{300}{480} = \$562.50$.

18 $\left.\begin{matrix} 16 : 18 \\ 4 : 2 \end{matrix}\right\} :: 640 : (360)$; or, $640 \times \frac{18}{16} \times \frac{2}{4} = \$360$.

19 $130 : 80 :: 117 : (72)$; or, $\frac{117}{130} \times 80 = \$72$.

20 $108 : 81 :: 120 : (90)$; or, $120 \times 81 \div 108 = 90$ horses.

21 $\left.\begin{matrix} 9 : 12 \\ 8 : 9 \end{matrix}\right\} :: 12 : (18)$; or, $12 \times \frac{12}{8} \times \frac{9}{9} = 18$ days.

22 $1.90 : 580 :: 20 : (4000)$; or, $\frac{20}{1.90} \times 380 = 4000$ lbs.

23 $1 : \frac{3}{4} :: 27 : (20\frac{1}{4})$; or, $27 \times \frac{3}{4} = 20\frac{1}{4}$ yds

24 $\left.\begin{matrix} 9\frac{1}{2} : 10 \\ \frac{3}{4} : 1\frac{1}{4} \end{matrix}\right\}$ ::11.40:(20); or, $11.40 \times \frac{2}{19} \times \frac{4}{3} \times 10 \times \frac{5}{4} = \$20.$

25 $\left.\begin{matrix} 6 : 9 \\ 60 : 80 \end{matrix}\right\}$ ::12:(24); or, $\frac{12}{6} \times \frac{80}{60} \times 9 = 24$ days

26 $4\frac{1}{2} : 3\frac{3}{8} :: 12 : (9)$; or, $12 \times \frac{2}{9} \times \frac{27}{8} = 9$ brooms.

27 $42 : 35 :: 6 : (5)$; or, $\frac{6}{42} \times 35 = 5$ men.

28 $\left.\begin{matrix} 10 : 7 \\ 28 : 25 \\ 10 : 8 \end{matrix}\right\}$ ::2:(1); or, $2 \times \frac{8}{28} \times \frac{7}{10} \times \frac{28}{10} = 1$ day.

29 $\left.\begin{matrix} 14 : 16 \\ 12 : 14 \end{matrix}\right\}$ ::42:(56); or, $\frac{42}{14} \times \frac{16}{12} \times 14 = \$56.$

30 $11\frac{1}{2} : 10\frac{1}{2} :: 3.45 : (3.15)$; or, $3.45 \times \frac{2}{23} \times \frac{21}{2} = \$3.15.$

31 $10\frac{1}{2} : 8\frac{3}{4} :: 12\frac{1}{4} : (10\frac{5}{24})$; or, $\frac{40}{4} \times \frac{21}{21} \times \frac{35}{4} = 10\frac{5}{24}$ ft. $= 10$ ft. $2\frac{1}{2}$ in.

32 $5\frac{5}{12} : 3\frac{1}{3} :: 16\frac{1}{4} : (10)$; or, $\frac{65}{4} \times \frac{12}{65} \times \frac{10}{3} = 10$ ft.

33 $\left.\begin{matrix} 18 : 4 \\ 12\frac{1}{4} : 237\frac{6}{13} \end{matrix}\right\}$ ::$3\frac{1}{4}$:(14); or, $\frac{13}{4} \times \frac{4}{18} \times \frac{4}{49} \times \frac{3087}{13} = 14$ days.

34 $\left.\begin{matrix} 36 : 44 \\ 22 : 14 \\ 7 : 12 \end{matrix}\right\}$ ::24:(32); or, $\frac{24}{36} \times \frac{44}{22} \times \frac{14}{7} \times 12 = 32$ gal.

35 $\frac{11}{71} : \frac{7}{9} :: 198 : (238)$; or, $198 \times \frac{17}{11} \times \frac{7}{9} = \$238.$

36 14 lbs. : 2072 lbs. :: 1 : (148); or, $\frac{1}{14} \times 2072 = \$148$

37 $7 \times 5 \times \frac{8}{8} \div .15 = 87\frac{1}{2}$ doz.

38 $.717 \text{ M} \times 15 \div .045 = 239$ lbs.

39 $150 \times \frac{125}{100} \times 1.20 \div .07\frac{1}{2} = 3000$ sacks.

40 $3 \times 60 \times \frac{7}{15} = 84$ weeks.

41 $12 \times 1.75 = \$21$; $80 \times .01\frac{1}{4} = \$1$. $21 \div 1 = 21$ sacks.

PARTNERSHIP

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1 $\$2500+\$1500=\$4000$. A's share $=\frac{25}{40}$, or $\frac{5}{8}$ of $\$1840=\$1150$.
B's " $=\frac{15}{40}$, or $\frac{3}{8}$ of $\$1840=\$\ 690$.

2 $\frac{13}{13}-\frac{5}{13}=\frac{8}{13}$ B's share. $\frac{5}{13}$ of $\$637=\$245$ A's loss.
$\frac{8}{13}$ of $\$637=\$392$ B's loss.

3 $40\times 11=440$. A's share $\frac{44}{96}$ of $\$96=\$44$.
$65\times\ 8=520$. B's " $\frac{52}{96}$ of $\$96=\$52$.
960.

4 $\$2892-\$964=\$1928$, sec. gain. $\frac{964}{2892}$ of $\$6000=\$2000$ inv. 1.
$6000-2000=\$4000$ inv. oth.

5 $\$2000\times 12=24{,}000$. $\frac{24}{96}$, or $\frac{4}{15}$ of $\$6045=\$1612$ A's share.
$3000\times 10=30{,}000$. $\frac{30}{96}$, or $\frac{1}{3}$ of $\$6045=\$2015$ B's share.
$4000\times\ 9=36{,}000$. $\frac{36}{96}$, or $\frac{3}{8}$ of $\$6045=\$2418$ C's share.
$90{,}000$.

6 $3+4+6=13$ parts. $\frac{3}{13}$ of $\$195=\$45$ share of first boy.
$\frac{4}{13}$ of $\$195=\$60$ " " second boy.
$\frac{6}{13}$ of $\$195=\$90$ " " third boy.

7 $1000+1500+1800+2000+2700=9000$ total indebtedness.
$\frac{1000}{9000}$, or $\frac{1}{9}$ $\$6000=\$666.66\frac{2}{3}$ A's share.
$\frac{1800}{9000}$, or $\frac{1}{5}$ " $=\$1000$ B's "
$\frac{1800}{9000}$, or $\frac{1}{5}$ " $=\$1200$ C's "
$\frac{2000}{6000}$, or $\frac{2}{9}$ " $=\$1333.33\frac{1}{3}$ D's "
$\frac{2700}{9000}$, or $\frac{3}{10}$ " $=\$1800$ E's "

8 $5175 \div 6210 = 83\frac{1}{3}$ cts. $1320 \times \$.83\frac{1}{3} = \$1100$.

9 $180 + 250 + 400 = 830$ tons. $\frac{18}{83}$ of $249 = 54$ tons, A's loss.
$\frac{25}{83}$ of " $= 75$ " B's "
$\frac{40}{83}$ of " $= 120$ " C's "

10 If A's $= 1$, then B's $= 3$, and C's $= 2$. Total 6 parts.
$\frac{1}{6}$ of $\$786 = \$131$ A's loss.
$\frac{3}{6}$ or $\frac{1}{2}$ of $\$786 = \$393$ B's loss.
$\frac{2}{6}$ or $\frac{1}{3}$ of $\$786 = \$262$ C's loss.

11 $\frac{6}{6} - (\frac{1}{2} + \frac{1}{6}) = \frac{1}{3}$ C's share.
$\frac{1}{2}$ of $\$600 = \$300$ A's gain. $300 \times 12 = \$3600$ total capital
$\frac{1}{2}$ of $\$3600 = \$1800$ A's investment
$\frac{1}{6}$ " $\$3600 = \$600$ B's "
$\frac{1}{3}$ " $\$3600 = \$1200$ C's "

12 $3 \times 20 = 60$ $\$1000 - \$100 = \$900$, am't to be divided
$5 \times 30 = 150$ $\frac{60}{210}$, or $\frac{2}{7}$ of $\$900 = \$257\frac{1}{7} + \$100 = \$357\frac{1}{7}$, share of first.
$\frac{150}{210}$, or $\frac{5}{7}$ of $\$900 = \$642\frac{6}{7}$ share of second.

13 $5316 \times .25 = \$1329$, contract price. $5 \times 45 \times 4 = \$900$ cost of teams. $\$1329 - \$900 = \$429$ profit. $\frac{2}{5}$ of $\$429 = \$171.60$, share of first. $\frac{3}{5}$ of $\$429 = \$257.40$ share of second.

14 $3 + 4 + 5 = 12$ parts. $\frac{8}{12}$, or $\frac{1}{3}$ of $1728 = 432$
$\frac{4}{12}$, or $\frac{1}{3}$ of " $= 576$
$\frac{5}{12}$ of " $= 720$

15 $1200 \times \$1.10 = \$1320$ A's share. $\frac{33}{44}$ of $\$3090 = \$990$ A's share
$800 \times 1.25 = 1000$ B's " $\frac{100}{44}$ " " $= \$750$ B's "
$1600 \times 1.12\frac{1}{2} = 1800$ C's " $\frac{18}{44}$ " " $= \$1350$ C's "
$\$4120$

PART III.

PERCENTAGE

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1 $\$75 \div .03 = \$2500$

2 $\frac{1}{4}$ of $\$1728 = \$432$

3 $\frac{1}{5} = \$750$, $\frac{5}{5} = 5 \times \$750 = \$3750$

4 $3200 \div 6400 = .20 = 20\%$.

5 $\frac{2}{300}$ of $\$9900 = \$66$.

6 $\$75 \div \frac{5}{300} = \$4500$.

7 $25.92 \div \frac{8}{2000} = \$1728$.

8 $\$102.50 \div 20500 = .00\frac{1}{2} = \frac{1}{2}\%$.

9 $\frac{5}{8}$ of $\$7288 = \$4555$.

10 $\frac{1}{6}$ of $\$36 = \$6$.

11 $490 \div 5000 = .09\frac{4}{5} = 9\frac{4}{5}\%$.

12 $\$6.50 = \frac{1}{8}$, $\frac{8}{8} = 8 \times \$6.50 = \$52$.

13 $\frac{2}{5}$ of $\$1683.25 = \$673.30$.

14 $\$150 = \frac{1}{3}$, $\frac{3}{3} = 3 \times \$150 = \$450$.

15 $\$729.80 = \frac{2}{3}$, $\frac{1}{3} = \frac{1}{2}$ of $\$729.80 = \$364.90$. $\frac{3}{3} = 3 \times \$364.90 = \$1094.70$.

16 $2.50 \div 20 = .12\frac{1}{2} = 12\frac{1}{2}\%$.

17 $.02\frac{1}{2} \times \$400 = \$10$.

18 $.018 \times \$1500 = \$27$.

19 $13.50 \div 81 = .16\frac{2}{3} = 16\frac{2}{3}\%$.

20 $\$37.50$ is 6%, $1\% = \frac{1}{6}$ of $\$37.50 = \$6.25$. $100\% = 100 \times \$6.25 = \$625$.

PRACTICAL WORK IN PERCENTAGE

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1 $\frac{3}{100}$ of \$3300 = \$99.

2 10%, or $\frac{1}{10}$ of \$2500 = \$250, for board; 5%, or $\frac{1}{20}$ of \$2500 = \$125, for clothing; 18% or $\frac{9}{50}$ of \$2500 = \$450, for incidentals.

3 40% = $\frac{2}{5}$. \$120 ÷ $\frac{2}{5}$ = \$300.

4 870 ÷ 5800 = $\frac{87}{580}$, = 15%.

5 $2\frac{1}{2} \div 20 = \frac{5}{40}$, = $\frac{1}{8}$, = $12\frac{1}{2}$%.

6 125% = $\frac{5}{4}$. \$6.25 ÷ $\frac{5}{4}$ = \$5.

7 \$36 ÷ .90 = \$40.

8 1250 ÷ 8750 = $\frac{1}{7}$ = $14\frac{2}{7}$%.

9 \$2150 ÷ .05$\frac{3}{8}$ = \$40,000.

10 $37\frac{1}{2}$% = $\frac{3}{8}$, $\frac{3}{8}$ of \$2400 = \$900.

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1 \$35 S. P. 100% C. 40% gain. \$35 is 140% of 35 ÷ 1.40 = \$25

2 100% C. $37\frac{1}{2}$% G. $137\frac{1}{2}$% S. P. $137\frac{1}{2}$% of \$7.20 = $\frac{11}{8}$ of 7.25 = \$9.90.

3 \$3500 S. P. \$500 loss. \$3500 + \$500 = \$4000. 500 is what part of 4000? 500 ÷ 4000 = $\frac{1}{8}$ = $12\frac{1}{2}$%.

4 100% C. − $16\frac{2}{3}$% loss. = $83\frac{1}{3}$% S. P. \$3.75 = $83\frac{1}{3}$%, or $\frac{5}{6}$; 3.75 ÷ $\frac{5}{6}$ = \$4.50.

5 \$3840 C. 100% C. − $2\frac{1}{2}$% L. = $97\frac{1}{2}$% S. P. 3840 × .02$\frac{1}{2}$ = \$96 loss. \$3840 − \$96 = \$3744 S. P.

6 \$1 cost of 12 lbs. \$1.20 S. P. of 12 lbs., .20 G. .20 ÷ 1 = .20 = 20%.

7 .50 S. P. – .37½ C. = 12½ G. .12½ ÷ .37½ = .33⅓ = .33⅓%.

8 1.05 S.P. 100% C. – 12½% L. = 87½%, or ⅞ S.P. 1.05 ÷ ⅞ = $1.20.

9 100% = C. 125% = marked price. ⅘ of 125% = 100% = S. P. ∴ Sold at cost, $1.50.

10 ¾ cost of part sold. ¼ selling price. ¼ gain.
Gain = ¼ on ¾ = ⅓ = 33⅓%.

11 2240 lbs. – 2000 lbs. = 240 lbs. 240 lbs. gained on sale of 2000 lbs. = 240 ÷ 2000 = 12%.

12 $1 = ⅘ of cost. $1 ÷ ⅘ = $1.25 C. $1.25 × 1.10 = $1.37½ S. P

13 $7 = 14⅔%, or, 1/7 of cost. 7 × $7 = $49 cost. $49 – $7 = $42 S. P

14 16⅔ cts. = $⅙, 20% = ⅕. ⅘ of $⅙ = 20 cts.

15 300 ÷ 12 = 25 doz. $1.50 ÷ 25 = $.06. $.06 × 141⅔% = 8½ cts.

16 $3.50 = 14%. 3.50 ÷ .14 = $25 cost. 2.75 ÷ 25 = .11 = 11%.

17 10c. = ⅛ of cost. 8 × 10 cts. = 80 cts. cost.

18 $160 = ⅘. $160 ÷ ⅘ = $180 C. of second and S. P. of first.
$180 ÷ 10/9 = $162 C. of first. $162 – $160 = $2 loss.
2 ÷ 162 = 1 1/81%.

19 $840 ÷ 12 = $70 cost per A. 4 × $85 = $340 S. P. of first.
3 × $75 = $225 " " second
⅘ of $70 = $60 S.P. per A. of third. 5 × $60 = $300 " " third.
$865 total S. P.
$865 S. P. – $840 C. = $25 gain. 25 ÷ 840 = 2 1/42%.

20 \$35 = $\frac{7}{6}$ of C. of first and $\frac{5}{6}$ of cost of second. $35 \div \frac{7}{6} = \$30$ C. of first. $35 \div \frac{5}{6} = \$42$ cost of second. $\$30 + \$42 = \$72$ cost. $\$35 + \$35 = \$70$ S.P. $\$72 - \$70 = \$2$ loss. $2 \div 72 = 2\frac{7}{9}\%$.

21 $\frac{6}{5}$ of 75c. = 90 cts. $\frac{6}{5}$ of 95 cts. = \$1.14. $\frac{6}{5}$ of \$1.10 = \$1.32.

22 55c. + 5c. = 60c. cost of each chair. $\$.60 \times 120 = \$72$ total cost. \$96 S. P. − \$72 C. = \$24 G. $24 \div 72 = \frac{1}{3} = 33\frac{1}{3}\%$.

23 $\frac{1}{5}$ leaked out. $\$.08 \div \frac{8}{9} = \$.09$ S. P., equivalent to cost. Gain $\frac{1}{9}$, S. P. $\frac{1}{9}$ of \$.09 = 10 cts.

24 $7.82 \div .92 = \$8.50$ cost of $\frac{2}{5}$. $\$8.50 \div \frac{2}{5} = \$21.25$ cost of whole c'sk 108% of \$21.25 = \$22.95. \$22.95 − 7.82 = \$15.13 S. P. of rem. $\frac{3}{5}$.

25 100% C. + 10% G. = 110% assumed S. P. 110% − 95% = 15%. \$5.55 = 15%, cost = \$5.55 ÷ .15 = \$37.

26 \$65 − 37.50 = \$27.50 cost of material. 110% of \$37.50 = 41.25 cost of labor. \$27.50 + \$41.25 = \$68.75 total cost. 120% of \$68.75 = \$82.50 S. P.

27 $1\frac{1}{8} \times \$1.06\frac{2}{3} = \$1.20$ S. P. per cental. $240 \times \$1.20 = \$288$ S. P.
$240 \times .96 = 230.40$ C.
75% of 288 = \$216 am't really received. \$230.40 C. − \$216 S. P. = \$14.40 L. $\$14.40 \div \$230.40 = 6\frac{1}{4}\%$ loss.

28 Cost 3 for \$5 or \$20 per dozen. $\$20 \times 3 = \$60$ C. + 10 G. = \$70 S. P. $\$70 \div 36 = \$1.94\frac{4}{9}$ av. S. P. $\$10 \div \$60 = \frac{1}{6} = 16\frac{2}{3}\%$ gain.

29 $\$31.25 = \frac{5}{6}$ of C. $\$31.25 \div \frac{5}{6} = \$37.50$ C. $\$37.50 \div 25 = \$1.50$ C per yard.

30 100 oranges − 5% loss = 95 oranges. $95 \times \frac{2}{3}$ C. = \$.63⅓ S. P. \$.63⅓ S. P. − \$.40 C. = 23½ cts. gain. $23\frac{1}{2} \div 40 = 58\frac{1}{3}\%$.

LOSS AND GAIN

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1 $1500 \times .07\frac{1}{2} = 112.50$ loss. $\$1500 - \$112.50 = 1387.50$ S. P.

2 $\$500 \div .02\frac{1}{2} = 20{,}000$ cost, $+ \$500 = \$20{,}500$ S. P.

3 $\$1320 \div .99 = \$1333\frac{1}{3}$ cost. $\$1333\frac{1}{3} - \$1320 = \$13\frac{1}{3}$ loss.

4 $75 \div 2000 = 3\frac{3}{4}\%$. $\$2000 - \$75 = \$1925$ S. P.

5 $\$1085 \times 1.07\frac{8}{7} = \$1170.25$ S. P., $- \$1085$ C. $= \$85.25$ gain.

6 $\$3050 - \$2375 = \$675$ gain $\div \$2375 = 28\frac{8}{19}\%$.

7 $\$147 \div .07 = \$2100$ C., $+ \$147$ G. $= \$2247$ S. P.

8 $\$2085 \div \frac{5}{6} = \$2502$ C., $- \$2085 = \$417$ loss.

9 $\$12.50 - \$10 = 2.50$ loss, $\div \$12.50 = 20\%$ loss.

10 $\$18.50 \div 1\frac{5}{6} = \$19.73\frac{1}{3}$ cost, $- \$18.50 = \$1.23\frac{1}{3}$ loss.

11 $\$45 \div .03\frac{1}{3} = \$1350$ C., $+ \$45 = \$1395$ S. P.

12 $\$1300 \times 1.30 = 1690$ S. P., $- \$1300 = \$390$ gain.

13 $\$125 \times 6 = \$750$ C. $- \$125 = \$625$ S. P.

14 $\$480 \div .73\frac{1}{3} = 654.\frac{6}{11}$ C. $- \$480 = \$174\frac{6}{11}$ loss.

15 $\$920 \times .85 = \$782$ S. P. $\$920 - \$782 = \$138$ loss.

16 $\$840 \div .13\frac{1}{3} = \$6300$ C., $- \$840 = \$5460$ S. P.

17 $\$95.50 - \$5.50 = \$90$ C. $\$5.50 \div \$90 = 6\frac{1}{9}\%$ G.

18 $\$200 - \$175 = \$25$ G., $\div \$175 = 14\frac{2}{7}\%$ G.

19 $\$7000 \times .14 = \$980$ G., $+ \$7000 = \$7980$ S. P.

20 $\$25.50 \times .50 = \$51$ C., $+ \$25.50 = \$76.50$ S. P.

21 $\$175 - \$150 = \$25$ G., $\div \$150 = 16\frac{2}{3}\%$.

22 $\$15 \times .80 = \$12$ S. P. $\$15 - \$12 = \$3$ loss.

23 $\$15 \div .83\frac{1}{3} = \$18$ C., $- \$15 = \$3$ loss.

24 $\$1030 \div 1.03 = \$1000$ cost.

COMMISSION

218 Page 190

1 $50 \times \$14 = \$700$ S. P., $\times .03 = \$21$ com. $\$700 - \$21 = \$679$ net.

2 $\$10.50 + \$1.14 = \$11.64$. $\$11.64 \times 50 = \$582$ C.
$\$679$ S. P. $- \$582$ C. $= \$97$ G. $97 \div 582 = 16\frac{2}{3}\%$.

3 $100 \times \$5.50 = \$550, \times 1.03 = \$566.50$ B. price

4 $\$3120 \div 1.04 = \$3000$ cost. $\$3120 - \$3000 = \$120$ com.

5 $\$3120 \times \$1.20 = \$3744$ S. P., $\div 750 = \$4.99\frac{1}{5}$ S. P. per bbl.

6 $6\frac{1}{4}\%$ of 32 cts. $= 2$ cts. com. 32 cts. $- 2$ cts. $= \$.30$ cts. per doz.

7 $\$14000 + \$2700 + \$1300 = \$18{,}000$ S. P., $\times .01\frac{3}{4} = \$315$ com.

8 $\$31500 \div 1.05 = \$30{,}000 \div 100 = 300$ bales.

9 $\$2490 \div 1.03\frac{3}{4} = \$2400, \times 1\frac{1}{6} = \$2905$ S. P.
$\$2400 \div \$.08 = 30{,}000$ lbs. $\$2905 \div \$30{,}000 = \$.09\frac{1}{6}$ S. P. per lb.

10 35% of $\$5 = \$1.75$. $\$1400 \div \$1.75 = 800$ vol.

11 $\$87.60 \div .03 = \$2920$.

12 $3000 \times \$1\frac{1}{6} = \$3500$ S. P. $\$3500 \times .02\frac{2}{7} = \$80$ com.
$\$3500 - \$80 = \$3420$ net.

13 $\$128.75 \div \$5150 = 2\frac{1}{2}\%$.

14 $\$5115 - \$165 = \$4950$ B. P. $\$165 \div \$4950 = 3\frac{1}{3}\%$.

15 $\$123 \div .03 = \$4100$.

16 $\$275 + \$1720 = \$1995$ cost. $\$25 \times 12 = \$300$ rent., $\times .05 = \$15$ com. $\$300 - \$15 = \$285$. $\$285 \div \$1995 = 14\frac{2}{7}\%$.

17 $\frac{3}{4}$ of $5600 = \$4200, \times .06\frac{1}{4} = \$262.50$ com.
$\$4200 - \$262.50 = \$3937.50$ proceeds.

18 $\$1890 \div .90 = \$2100$.

19 5% of $\$1.20 = \$.06$. $\$1.20 + \$.06 + \$\ 01\frac{1}{2} = \$1.27\frac{1}{2}$ C., $\times 1.25 = \$1.59\frac{3}{8}$ S. P.

20 $\$2689.75 \div 1.01\frac{1}{2} = \$2650$. $\$2650 \div .03\frac{1}{3} = 79{,}500$ lbs.

21 $\$25 \div .03\frac{1}{3} = \$750$. $\$750 \div .08\frac{1}{3} = 9000$ lbs. $\$775 \div 9000 = \$.08\frac{1}{12}$ per lb.

22 $\$5150 \div 1.03 = \$5000$. $\$5000 \div \$5 = 1000$ bbl.

23 $100 \times 480 = 48{,}000$ lbs. $\div 100 = 480$ cwt., $\times \$18 = \$8640$, $\times .05 =$ \$432 com.

24 $450 \times \$13 = \$5850$, $\times .05 = \$292.50$ com. $\$5850 - \$292.50 = \$5557.50$. $\$5557.50 \div 1.04 = \$5343.75$ wool investment $\$5557.50 - \$5343.75 = \$213.75$ com. $\$5343.75 \div \$.22\frac{1}{2} = 23{,}750$ lbs. $\$292.50 + \$213.75 = \$506.25$ total com.

25 $500 \times \$2.50 = \$1250 + \$12 = \$1262$. $\$1287 - \$1262 = \$25$ com. $\$25 \div \$1250 = 2\%$.

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1 $\$165 \div \$6600 = 2\frac{1}{2}\%$ rate. $\$6600 - \$165 = \$6435$ proceeds.

2 $\$140 \div .01\frac{3}{4} = \$8000$ C.

3 $\$5600 \div 1.025 = \$5463.41$ cost. $\$5600 - \$5463.41 = \$136.59$ com.

4 $\$13.50 \div .01\frac{1}{2} = \$900$ S. P. $\$900 - \$13.50 = \$886.50$ proceeds.

5 $\$8732 \times .02 = \$174.64$ com. $\$8732 - \$174.64 = \$8557.36$ proceeds

6 $\$14.21 \div \$568.38 = 2\frac{1}{2}\%$ rate.

7 $\$420 \div \$14{,}000 = 3\%$ rate.

8 $\$2209 + \$141 = \$2350$ S. P. $\$141 \div \$2350 = 6\%$ rate.

9 $\$4000 - \$250 = \$3750$. $\$250 \div \$3750 = 6\frac{2}{3}\%$ rate.

10 $\$2182.80 \div 1.02 = \$2140$ C. $\$2182.80 - \$2140 = \$42.80$ com.

11 $\$4872 - \$4800 = \$72$ com. $\$72 \div \$4800 = 1\frac{1}{2}\%$ rate.

12 $\$48.29 \div .02\frac{3}{4} = \$1756$ S. P.

13 $1500 - $41.12 = $1458.88. $41.12 ÷ $1458.88 = 2¼%.

14 $4975 + $25 = $5000 S. P. $25 ÷ $5000 = ½%.

15 $74.25 ÷ .06¼ = $1188 cost.

16 $2000 × .00¼ = $5 com.

INSURANCE

222 Page 195.

1 $5500 × .00⅘ = $44 premium. $5500 − $44 = $5466 loss.

2 $110 ÷ .02¾ = $4000 value.

3 360 ÷ 48,000 = .0075 = ¾%.

4 $4000 ÷ 2 = $2000, × .01 = $20 premium. $2000 − $20 = $1980.

5 $62.50 ÷ .025 = $2500. $2500 = ⅔, ⅗ = ¾ of $2500 = $3750.

6 $3600 − $3528 = $72 com. $72 ÷ $3600 = 2%.

7 $7600 ÷ 1.01⅓ = $7500 insurance. $7600 − $7500 = $100 prem.

8 $6000 + $1800 + $1200 = $9000, × ⅔ = $6000.
$106 − $1 = $105, ÷ 6000 = 1¾%.

9 $6500 + $500 = $7000, × 5/7 − $5000. ¾% of $5000 = $37.50.
$7000 + $37.50 = $7037.50 total cost. $7037.50 × .96 = $6756.

10 $2846.25 ÷ 1.035 = $2749.951 am't invested, ÷ $5½ = 500 bbl.
1¼% of $2746.95 = $34.374 ins., + $2846.25 = $2880.624 total C.
10% of $2880.624 = $288.0624 gain + 2880.624 cost =
$3168.68 S. P., ÷ 500 = $6.337 +.

11 $\$30 \div \$2400 = \frac{1}{80} = 1\frac{1}{4}\%$.

12 $\$1500 \times \frac{3}{4}\% = \$11.25 \times 2 = \$22.50$ first cost.
$\$3200 \times \frac{7}{8}\% = \$28$ 2d cost. $\$28 - \$22.50 = \$5.50$ favor of first.

13 $3\% \times 3 = 9\%$. 9% of 2400 = \$216. $\$2400 - \$216 = \$2184$ loss.
[Not strictly true, as company had use of premium at ruling interest rates, which lessens the loss considerably.]

14 $£1500 \times \frac{4}{5}\% = £12, \times \$4.86 = \$58.32$.

15 $\$2562 - \$42 = \$2520$. $42 \div 2520 = 1\frac{2}{3}\%$.

16 $\$19.80 \times 8 = \$158.40$ annual payment, $\times 20 = \$3168$.

17 [$6\frac{2}{3}\%$ should read $\$6\frac{2}{3}$] $\$6\frac{2}{3} \div .01\frac{1}{3} = \$500$.

18 $\$10.50 \div .0175 = \$600 \div \frac{2}{3} = \$900$ cost.
$\$900 \times 1.16\frac{2}{3} = \$1050, \div 200 = \$5.25$ per bbl.

19 $\$2100 \times .008 = \$16.80$ premium $+ \$2100 = \$2116.80$.

20 \$6000 cost + \$75 insurance + \$900 repairs = \$6975 total cost.
$\$6975 + (\frac{1}{3}$ of $\$6975) = \$9300$ S. P. house.
$\$9300 \div 1.03\frac{1}{3} = \$9000 \div \$4\frac{1}{2} = 2000$ bbl.
2000 bbl. $\times \$4 = \$8000$ S. P., $- (3\frac{1}{8}\%$ of $\$8000) = \$7750$ received.
$\$7750 - \$6975 = \$775$ gain. $775 \div 6975 = 11\frac{1}{9}\%$.

TAXES

225 Page 198

1 $1200 \times \$1.50 =$ poll tax. $\$21800 - \$1200 = \$20,000$.
$20,000 \div 4,000,000 = \frac{1}{200} = \frac{1}{2}\%$.

2 $\$4000 + \$1800 = \$5800 \times \frac{1}{2}\% = \$29$ property tax.
$\$29 + \$1.50 = \$30.50$.

3 $16 - $1.50 = $14.50 property tax. $14.50 ÷ .005 = $2900.

4 $5500 + $1700 = $7200 × .005 = $36 property tax.
$36 + (3 × $1.50) = $40.50.

5 $4500 ÷ $1,000,000 = .0045 = 45 cts. on the hundred.

6 $8500 - $500 = $8000. $8000 ÷ .016 = $500,000.

7 $3000 ÷ .003 = $1,000,000. $\frac{3}{10}\%$ = 3 mills on the dollar.

8 $3500 × .00$\frac{1}{2}$ = $7.

9 $4750 ÷ .95 = $5000 tax. $5000 × $450,000 = $1\frac{1}{9}\%$.

10 $7500 + $2750 = $10,250. $10,250 × .008 = $82 property tax.
$82 + (2 × $2 poll tax) = $86.

11 485 × $2 = $970 poll tax - (10% of $970) = $873.

12 $\frac{3}{4}$ of $2000 = $1500 × .008 = $12 insurance.
$\frac{2}{3}$ of 2400 = $1600 × .014 = $22.40 tax. 20% of $2400 = $480.
$480 + $12 + $22.40 = $514.40 ÷ 12 = 42.86\frac{2}{3}$ per month.

13 $2850 ÷ .95 = $3000. tax. $3000 ÷ .005 = $600,000.

14 $77.50 × 12 = $930 yearly rent.
$\frac{5}{7}$ of 7000 = $5000 × .0075 = $37.50 insurance.
$\frac{3}{4}$ of $7000 = $5250 × .01 = $52.50 taxes.
$37.50 + $52.50 = $90 total expenses.
$930 - $90 = $840 true income. 840 ÷ 7000 = 12%.

DUTIES

227 Page 200

1 $100 \times \$.25 = \$25$ on oranges. $60 \times \$.30 = \$18$ on lemons. $\$25 + \$18 = \$43$ duty.

2 $100 \times \$15 = \$1500 \times .25 = \$375$.

3 11×2240 lb. $= 24640$ lb., $\times .009 = \$221.76$

4 12×225 lb. $= 3060$ lb. $\times \$.80 = \$2448$ original cost. 3060 lb. $\times \$.35 = \$1071$ duty. $\$2448 \times .35 = \$856.80$ ad val. $\$2448$ cost $+ \$1071$ duty $+ \$856.80$ ad val. $+ \$72.50$ charges $=$ $\$4448.30$ total cost.

5

80	$\times \$7. =$		\$560	champagne
90	$\times$ 2. $=$		180	brandy
$94\frac{1}{2}$	$\times$ .50 $=$		47.25	wine
75	$\times$ .35 $=$		26.25	ale
			\$813.50	total

6 $\$2283.60 \div .60 = \$3806$.

7

1280 yd.	$\times \$.30 =$	\$384	duty on carpet.
1440 "	$\times$ .20 $=$	288	duty on tapestry.
\$725 "	$\times$ .30 $=$	217.50	ad. val. on carpet.
\$650 "	$\times$ .30 $=$	195	ad. val. on tapestry.
		\$1084.50	Total.

8 840 lb. $\div$ 56 lb. $\times \$.20 = \$3$.

9 1000 T. $\times \$.75 = \$750$.

10 200 T. $\times 20 \times .08 = \$320$.

11 50×108 lb. $= 5400$ lb. $\times \$.01 = \$54$.

12 $\$94 \times .20 = \$18.80$.

13 $200 \times \$.45 = \$90 \times \$.20 = \$18$.

STOCKS

228 Page 202

2 $\$1000 \times .00\frac{1}{4} = \$2.50$ brokerage $+ \$1020 = \$1022.50$.

3 $\$1000 \times .04 = \$40$ dividend. $\$40 \div \$1022.50 = 3\frac{3}{4}\frac{7}{6}\frac{3}{5}\%$.

4 $\$320 \div .04 = \$8000$ of stock $= 80$ shares. $\$102 \times 80 = \$8160$.

5 $\$720 \div .09 = \$8000$ of stock $= 80$ shares. $80 \times \$60 = \$4800$.

6 $.07 \div 1.4525 = 4\frac{8}{8}\frac{3}{3}\%$.

7 $.12 \div 1.6925 = 7\frac{6}{6}\frac{1}{7}\frac{1}{7}\%$ B. of Cal. $.09 \div 1.25 = 7\frac{1}{5}$ F. N.

8 $\$99\frac{7}{8} - \$82 = \$17\frac{7}{8}$. $\$2860 \div \$17\frac{7}{8} = 160$ shares.
$160 \times \$82 = \$13{,}120$.

9 $17\frac{7}{8} \div 82 = 21.8 - \%$.

10 $\$4000 \times .00\frac{5}{8} \times \$25$ taxes. $\$275 - \$25 = \$250$ income. $250 \div 5000 = 5\%$ house. $\$5000 \times 1.12 = \$5600$. $\$5600 \div .70 = \$8000$ of stock. $\$8000 \times .03\frac{1}{2} = \$280$ income. $280 \div 5600 = 5\%$ stock.

11 $\$1468 \div \$91.75 = 16$ shares.

12 $150 \times \$2.50 = \$375$. $\$375 \times .00\frac{1}{2} = 1.87\frac{1}{2}$ com.
$\$375 + \$187\frac{1}{2} = \$376.87\frac{1}{2}$.

13 $.99 \times .11\frac{1}{9} = 11\%$.

14 $50 \times \$2.50 = \$125$. $100 \times \$1\frac{1}{4} = \$125$. $\$250 \times .00\frac{1}{2} = \$1.25$ com. $\$250 + \$1.25 = \$251.25$.

15 $109\frac{1}{2} - \$101 = \$8.50$ loss on each share. $\$340 \div \$8.50 = 40$ sh's.

16 $\$570 \div \$6 = 95$ shares. $95 \times \$66.50 = \$6317.50$.

17 $.05 \div .87\frac{1}{2} = 5\frac{5}{7}\%$ S. P. R. R. $.06 \div .99 = 6\frac{2}{33}\%$ O. N.

18 $24 \times \$53.50 = \$1234$. $\$1284 \div \$107 = 12$ shares.

19 $\$1182.50 \div \$118\frac{1}{4} = 10$ shares.

INTEREST

231 Page 207

	Time			Interest on $1.	Interest on Principal	Amount
	yr.	mo.	da.			
1	1	1	8	$\$.006\frac{1}{3}$	$ 11.9068	$ 191.41
2	2	11	6	.176	57.20	382.20
3	3	2	16	$.192\frac{2}{3}$	146.1858	904.94
4	2	3	22	$.138\frac{2}{3}$	142.0293	1166.28
5		2	14	$.012\frac{1}{3}$	7.2088	591.71
6	1	3	11	$.076\frac{5}{6}$	55.7687	781.61
7	3	6	24	.214	83.0213	470.97
8			24	.004	.1688	42.37

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	Time yr.	mo.	da.	Interest on $1.	Interest on Prin.
				.01$\frac{1}{3}$	$ 6.00
				.01$\frac{2}{3}$	7.50
1	0	3	0	.02	9.00
2	2	3	0	.11$\frac{1}{4}$	43.53$\frac{3}{4}$
				.15$\frac{3}{4}$	60.95$\frac{1}{4}$
				.18	69.66
3	2	0	0	.08	57.46
4	3	3	10	.22$\frac{17}{18}$	94.07$\frac{7}{9}$
5	3	20	0	.15$\frac{5}{18}$	109.694
6	2	2	25	.156$\frac{19}{36}$	59.48
7	2	5	17	.049$\frac{5}{18}$	83.772
8	0	2	14	.012$\frac{1}{3}$	11.229
9		4	21	.019$\frac{7}{12}$	14.648
10		5	24	.019$\frac{1}{3}$	16.916
11	1	0	9	.071$\frac{3}{4}$	180.236
12		6	0	.04	154.

PROBLEMS IN INTEREST

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1 $360 × .06 = $21.60 int. for 1 year. $97.20 ÷ $21.60 = 4½ yr. = 4 years 6 months.

2 $900 \times .07 = \$63$ int. for 1 yr. $\$84 \div \$63 = 1\frac{1}{3}$ yr. $= 1$ yr. 4 mo.
$900 \times .08 = \$72$ " " $\$84 \div \$72 = 1\frac{1}{6}$ yr. $= 1$ yr. 2 mo.

3 \$1 @ 5% for 2 yr. 6 mo. $= \$.125$ int. $\$62.50 \div \$.125 = \$500$.

4 \$145 @ 1% for $\frac{1}{2}$ yr. $= \$.725$ int. $\$5.80 \div \$.725 = 8$; or 8%

5 \$240@1% for given time $= \$8.40$ int. $\$56 \div \$8.40 = 6\frac{2}{3}$; or $6\frac{2}{3}$%.

6 \$1 @7% " " $= \$1.23\frac{1}{3}$ amt. $\$296 \div \$1.23\frac{1}{3} = \$240$.

7 \$1 @ 6% " " $= \$1.03$ " $\$700 \div \$1.03 = \$679.61$

8 \$720 @ $1\frac{1}{4}$% for one month $= \$10.80$ int.
$\$16.20 \div \$10.80 = 1\frac{1}{2}$ mo. $= 1$ mo. 15 da.

9 \$1@$\frac{1}{2}$% per mo. for given time $= \$1.02$ amt.
$\$400 \div \$1.02 = \$392.16$.

10 \$1 @ 6% for given time $= \$1.03$ amt.

$\$390 \div \$1.03 = \$378.64$ P.W. $\$390 - 378.64 = \$11.36$ disc.

11 \$1 @ 8% for given time $= \$1.04$ amt.
$\$104 \div \$1.04 = \$100$ P. W. $\therefore$ No diff.

12 $\$700 \times .08 = \$56$ int. $\$450 \times .08 = \$36$ int. 1 yr.
$\$56 \div \$36 = 1$ yr. 6 mo. 20 da.

13 $\$250 \times 1.04 = \$240.38$ P. W.
$\$250 \div 1.06 = 235.85$ P. W.
$\$250 \div 1.09 = 229.36$ P. W. \$705.59 total P. W.

14 $\$7500 \div 1.02 = \$7352.94$ P. W.; or cost.

\$7500 S. P. $- \$7352.94 = \$147.06$ gain.

15 $35 \times 12 = \$420$ annual income. $\$420 \div \$3400 = 12\frac{6}{17}\ \%$.

16 \$275 @ 1% for given time = \$9.35 int. $\$56.10 \div 9.35 = 6$; or 6%.

17 \$1 @ $7\frac{1}{2}\%$ for given time $= .240\frac{5}{8}$ int.
$\$103.95 \div \$.240325 = \$432$ prin.

18 \$1 @ 6% for given time = .005 int. $\$100 \div .005 = \$20{,}000$ prin.

19 \$1 @ 6% for given time = 1.2185 amt.
$\$926.06 \div \$1.2185 = \$760$ prin.

20 (Same as example 8.)

21 $\$125 \times .04 = \$5$ int. 1 yr. $\$16.50 \div \$5 = 3$ yr. 3 mo. 18 da.

22 \$760 @ 1% for given time $= \$27.67\frac{2}{3}$ int.
$\$166.06 \div 27.67\frac{2}{3} = 6$; or 6%.

23 \$1 @ 6% for 2 mo. 9 da. = \$1.0115 amt.
$\$221.27 \div \$1.0115 = \$218.75$.

24 \$1 for given time @ 8% = .02 int. $\$125 \div .02 = \$6250$.

25 \$1 for given time @ 6% = \$1.1575 am't.
$\$560.23 \div \$1.1575 = \$484$.

26 $\$90 \times .07 = \$6.30$ int. 1 yr. $\$10 \div \$6.30 = 1$ yr. 7 mo. 2 da. = Jan. 3, 1882.

27 $\$460 \times .05 = \$23$ int. 1 yr. $\$71.30 \div \$23 = 3$ yr. 1 mo. 6 da.

28
$\$200 \div 1.01 = \$198.01$.
$300 \div 1.015 = 295.56$.
$400 \div 1.02 = 392.15$.
\$885.72 total P. W.

29 $210 ÷ 1.04 = $201.92 P. W.; or S. P. $201.92 − $200 = $1.92 G.

30 $410@1% for given time = $4.51 int. $27.06 ÷ $4.51 = 6; or 6%.

31 $210 ÷ $.28 (int. on $1) = $750 prin.

32 $550 × .06 = $33 int. 1 yr. $102 ÷ $33 = 3 yr. 1 mo. 3 da.

33 $270 × .06 = $16.20 interest. $270 ÷ 1.06 = $254.717 P. W. $270 − $254.717 = $15.283 discount. $16.20 interest − $15.283 discount = $.917 difference.

34 7½% − 6% = 1½% gain per year. $35.10 ÷ .045 = $780 principal.

35 $75@1% for 4 mo. = $.25 int. $2.00 ÷ $.25 = 8; or 8%.

36 $1000 ÷ 1.01 = $990.09 P. W.
500 ÷ 1.025 = 487.80 P. W.
500 ÷ 1.015 = 492.61 P. W.
$1970.50 total P. W.

PARTIAL PAYMENTS

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1

$1500	prin.
54	int.
1554	amt.
500	pymt.
1054	new prin.
21.08	int.
1075.08	amt.
500	2d pymt.
575.08	new prin.
2.30	int.
$577.38	balance due.

2

$480	prin.
16.80	int.
496.80	amt.
196.80	pymt.
300	N. prin.
10.50	int.
310.50	amt.
214	2nd pymt.
96.50	N. prin.
3.37	int.
$99.87	bal. due

3

$1000	prin.
50	int.
1050	amt.
50	pymt.
1000	N. prin.
26.60	int.
1026.60	amt.
450	2nd pymt.
$ 576.60	bal. due

4

$1230	prin.
11.265	int. 2m. (.009$\frac{1}{6}$)
1241.275	amt.
98	1st pymt.
1143.275	N. prin.
16.768	int.3m6d(.014$\frac{2}{3}$)
1160.043	amt.
500	2nd pymt.
660.043	N. prin.
10.386	I. 3m13d(015$\frac{5}{11}$)
670.429	amt.
290	3rd pymt.
380.429	N. prin.
4.649	I.2m 20d (.012$\frac{2}{3}$)
385.078	amt.
100	4th pymt.
285.078	N. prin.
.914	I. 21 da.(.003$\frac{5}{11}$)
$285.992	balance due.

5

$800	prin.
35.333	I. 5m. 9d(.044$\frac{1}{6}$)
835.333	amt.
200	1st pymt.
635.333	N. prin.
3.706	I. 21 da.(.005$\frac{5}{6}$)
639.039	amt.
50	2d pymt.
589.039	N. prin.
19.62	I. 4 mo. (.033$\frac{1}{3}$)
608.659	
15.	3d pymt.
593.659	N. prin.
9.894	I. 2 mo. (.016$\frac{2}{3}$)
$603.553	balance due.

6

$365	prin.
3.65	I. 2 mo. (.01)
368.65	amt.
68.65	1st pymt.
300	N. prin.
3.40	I. 2m. 8d. (.011$\frac{1}{3}$)
303.40	amt.
103.40	2d pymt.
$200	balance due.

7 $2500 prin.
70.972 int.
2570.972 amt.
500 1st pymt.
2070.972 N. prin.
27.89 int.
2098.862 amt.
750 2d pymt.
1348.862 new prin.
38.02 int.
$1386.882 balance due.

8 $960 prin.
13.20 I. 2 m. 6d. (.013¾)
18.00 I. 3 mo. (.018¾)
991.20 amt.
370 1st and 2d pymts
621.20 N. prin.
3.8825 I. 1 mo. (.006¼)
625.08 amt.
300 3d pym
$325.08 balance due.

9 $500 prin.
3.33⅓ int. 1 mo. (.00⅔)
$503.33 amt.
100 1st pymt.
403.33 N. prin.
2.69 int. 1 mo. (.00⅔)
406.02 amt.
100 2d pymt.
306.02 N. prin.
2.04 int. 1 mo. (.00⅔)
308.06 amt.
100 3d pymt.
208.06 N. prin.
1.378 int. 1 mo. (.00⅔)
$209.447 balance due.

10 $1200 prin.
17 I. 2 m. 25 d. (.014⅙)
1217 amt.
500 1st pymt.
717 N. prin.
9.6795 I. 2 m 21 d (.013¼)
726.68 amt
500 2d pymt.
226.68 N. prin.
2.266 int. 2 mo. (.01)
$228.946 balance due.

COMPOUND INTEREST

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1 $1000 prin.
1.06
1060 amt. 1 yr.
1.06
1123.60 amt. 2 yrs.
1.06
1191.016 amt. 3 yrs.
1.06
1262.4769 amt. 4 yrs.
1000
262.48 comp. int.

2 $300
1.04
312 amt. 6 mo.
1.04
324.48 amt. 1 yr.
1.04
337.46 amt. 1 yr. 6 mo.
$1.00\frac{2}{3}$
339.709 amt. 1 yr. 7 mo.
300
$39.709 comp. int.

3 $425
1.01
429.25 amt. 3 mo.
1.01
433.542 amt. 6 mo.
1.01
437.87 amt. 9 mo.
$1.00\frac{2}{3}$
440.789 amt. 11 mo.
425
$15.80 comp. int.

4 $250
$1.02\frac{1}{2}$
256.25 amt. 6 mo.
$1.02\frac{1}{2}$
262.66 amt. 1 yr.
$1.00\frac{5}{12}$
263.75 amt. 1 yr. 1 mo.
250
13.75 comp. int.

5 $500
1.06
530 amt. 1 yr.
1.06
361.81 amt. 2 yrs.
$1.01\frac{1}{2}$
570.227 amt. 2 yr. 3 mo.
500
$70.23 comp. int.

6 $490
1.02
499.80 amt. 3 mo.
1.02
509.796 amt. 6 mo.
$1.01\frac{1}{3}$
516.60 amt. 8 mo.
490
$26.60 comp. int.

7 $1500
$1.03\frac{1}{2}$
1552.50 amt. 6 mo.
$1.01\frac{41}{120}$
1573.33 amt. 8 mo. 9 da.
1500
$73.33 comp. int.

8 $275
$1.01\frac{1}{2}$
279.125 amt. 3 mo.
$1.01\frac{1}{2}$
283.31 amt. 6 mo.
$1.01\frac{1}{2}$
287.559 amt. 9 mo.
275.
$12.56 comp. int.

9 $800
1.06
848 amt. 1 yr.
1.06
898.88 amt. 2 yr.
1.02
916.857 amt. $2\frac{1}{3}$ yr.
800
$116.86 comp. int.

10 $1200
1.03
1236 amt. 6 mo.
1.03
1273.08 amt. 1 yr.
1.03
1311.27 amt. 1 yr. 6 mo.
1.001
1312.58 A. 1 y. 6 mo. 6 d.
1200
$112.58 comp. in

DISCOUNT

243 Page 218

1 Discounted 2 mo. $\$700 \times .01\frac{1}{3} = \$9.33\frac{1}{3}$ discount.
$\$700 - \$9.33\frac{1}{3} = \$690.67$ proceeds.

2 Discounted 32 da. $\$850 \times .01\frac{1}{15} = \$9.06\frac{2}{3}$ discount.
$\$850 - \$9.06\frac{2}{3} = \$840.93$ proceeds.

3 $\$1400 \times 1.04 = \$1456$ amt. of note. Discounted 3 mo.
$\$1456 \times .02 = \$29.12$ dis. $\$1456 - \$29.12 = \$1426.88$ proceeds.

4 $\$900 \times 1.03 = \$927$ amt. of note. $\$927 \times .02 = \$18.54$ discount.
$\$927 - \$18.54 = \$908.46$ proceeds.

5 $\$250 \times .01 = \$2.50$ discount. $\$250 - \$2.50 = \$247.50$ proceeds.

6 Discounted 23 da. $\$1850 \times .00\frac{2}{3}\frac{3}{0} = \$14.18$ discount
$\$1850 - \$14.18 = \$1835.82$ proceeds.

7 $\$525 \times 1.02 = \$535.50$ amount of note. Discounted 3 months.
$\$535.50 \times .03 = \$16.065$ discount. $\$535.50 - \$16.065 = \$519.435$.

8 $\$300 \times 1.04\frac{1}{2} = \$313.50$ amt. of note. Discounted $3\frac{1}{3}$ mos.
$\$313.50 \times .05 = \$15.675$ discount. $\$313.50 - \$15.675 = \$297.83$.

9 $\$1140 \times 1.08 = \$1231.20$ amt. of note. Discounted $10\frac{9}{1}\frac{}{0}$ mos.
$\$1231.20 \times .07\frac{4}{15} = \$89.467$ discount.
$\$1231.20 - \$89.467 = \$1141.73$ proceeds.

10 Discounted $2\frac{2}{15}$ mos. $\$1375 \times .01\frac{7}{9} = \$24.44$ discount
$\$1375 - \$24.44 = \$1350.56$ proceeds.

11 $\$735 \times 1.025 = \$753.375$ amt. of note. Discounted 48 days.
$\$753.375 \times .032 = \$24.108$ dis. $\$753.375 = \$24.108 = \$729.267$.

COMMERCIAL DISCOUNT

244 Page 220

1 $\$450 \times .60 = \$270 \times .95 = \$256.50$ ans.

2 $.75 \times .95 = .71\frac{1}{4}$. $\$1.00 - .71\frac{1}{4} = .28\frac{3}{4}$; or, $28\frac{3}{4}\%$ discount.

3 $\$250 \times .65 = \$162.50$, at 35% dis. $\$250 \times .30 = \$175 \times .95 = \$166.25$, at 30 and 5 dis. $\$166.25 - \$162.50 = \$3.75$ more.

4 $\$810 \div .90 = \$900 \div .90 = \$1000$ ans.

5 $\$200 \times .95 = \$190$.

6 $\$830 \times .70 = \$581 \times .90 = \$522.90 \times .95 = \$496.75$ cost.
$\$496.75 \times 1.20 = \$596.10$ S. P.

7 $\$76 \div .95 = \$80$ invoice price.

8 $\$425.50 \times .90 = \$382.95 \times .95 = \$363.80$ cash value.

9 $\$725 \times .97 = \$703.25$ cash value.

10 $\$5.50 \times .90 = \$4.95 \times .90 = \$4.45$ price paid.

11 $\$1.50 \div .83\frac{1}{3} = \$1.80 \div .75 = \$2.40$ list price.

12 $\$700 \times .85 = \$595 \times .96 = \$571.20$ amt. received.

EXCHANGE

245 Page 230

1 $\$5000 \times 1.015 = \$5075$ cost of sight draft.
$\$5075 \times .98\frac{2}{3} = \$5008.33\frac{1}{3}$.

2 $\$580 \times .99\frac{1}{2} = \$577.10$.

3 $2481.25 \div .99\frac{1}{4} = \$2500$.

4 $320 \times \$4.95 = \$1584$ cost of sight draft. $\$1584 \times .98\frac{5}{8} = \$1565.52$.

5 $\$1566.15 \div .985 = \$1589.94$.

6 $\$1 + .015$ premium $- .015$ int. allowance $= \$1$. $\therefore$ cost $= \$4500$.

7 $4000 \times .186 = \$744 \times .99 = \$736.56$.

8 $\$800 - \$794 = \$6$ discount. $6 \div 800 = \frac{3}{4}\%$.

9 $\$765 \times 1.00\frac{3}{4} = \$770.7375$ cost of sight draft.
$\$770.7375 \times .99\frac{1}{3} = \$769.04$.

10 $\$799.60 \div .9945 = \$804.022$ cost of \$800 sight draft.
$\$4.022$ premium $\div \$800 = \frac{1}{2}+\%$.

11 $1000 \times .186 = \$186$. $\$1 + .015$ premium $- .015$ int. allowance $=$ $\$1$ $\therefore$ Cost $= \$186$.

12 $\$162.75 = 875$ fr. $\$1 + .015$ premium $- .015$ int. allowance $=$ $\$1$ $\therefore$ Draft $= 875$ fr.

13 26 fr. pr. £ = less than \$.186 to fr., hence exchange is at a discount. 500×26 fr. $= 13{,}000$ fr. $\times .99\frac{1}{6} = 12{,}891\frac{2}{3}$ fr.

AVERAGE OF PAYMENTS

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1 $\$180 \times 5 = 900$ mo.
$250 \times 8 = 2000$
$100 \times 9 = 900$ It equals the use of \$1 for 3800 mo.

\$530 3800 mo.
$3800 \div \$530 = 7$ mo. 5 da.

2 $ 800×3=2 00 mo. 6400 mo.÷1800=3 mo. 17 da.
1000×4=4000
$1800 6400 mo.

3 $150×3= 450 mo.
175×4= 700
200×6=1200 2350÷525=4 mo. 14 da.
$525 2350 mo. Apr. 8+4 mo. 14 da.=Aug. 22.

4 $390×16=6240 da. 15,740÷865=18 da.
475×20=9500
$865 15,740 da.

5 $100×1 = 100 da.
150×18=2700
200×38=7600 10,400÷450=23 da.
$450 10,400 da. May 31+23 da.=June 23.

6 $250×8=2000÷400=5 mo. Ans.

7 550×6=3300÷10=$330.

8 $1000×10=10,000 mo.
$250×4=1000 mo. 10,000 mo.−5000 mo.=5000 mo.
500×8=4000. 5000÷$250 (balance due)=20 mo. Ans.
$750 5000 mo.

9 $400×2=800 mo. 1940 mo.÷705=2 mo. 23 da.
80×3=240.
225×4=900. Mar. 22+2 mo. 23 da.=June 14.
$705 1940 mo.

AVERAGE

249 Page 235

1 2 × $2.50 = $5 00
3 × 3.00 = 9.00
10 × 3.25 = 32.50
15 are w'th $46.50

$46.50 × 15 = $3.10 each.

2 10 × $ .90 = $9.00
8 × .95 = 7.60
7 × 1.00 = 7.00
25 are w'th $23.60

$23.60 ÷ 25 = $.94⅔ per cen.

3 45 × $ .08 = $3.60
30 × .10½ = 3.15
75 lb. cost $6.75

$6.75 × 1.10 = $7.425 S.P.
$7.425 ÷ 75 = .09 9/10 pr. lb.

4 8 × $ .40 = $3.20
10 × .50 = 5.00
18 cost $8.20

18 × $.50 = $9.00 S. P. − 8.20 C. = $.80 G.
$.80 G. ÷ $8.20 C. = 9 9/41 %.
$.80 ÷ 18 = $.04⅔ per roll.

5 50 gal. × $ .35 = $17.50
50 × .42 = 21.00
5 × .40 = 20.00
50 × .00
200 gal. are worth $58.50

$58.50 ÷ 200 = $.29¼ per gal.

6 12 lb. × $ .06 = $ .72
9 × .08 = .72
15 × .11 = 1.65
17 × .13 = 2.21
53 lb. are worth $5.30

$5.30 ÷ 53 = $.10 per lb.

7 5 lb. × $ .40 = $2.00 — 24 × $.30 = $7.20 selling price.
7 × .25 = 1.75 — −$6.75 C. = $.45 gain.
10 × .20 = 2.00
2 × .50 = 1.00
24 lb. cost $6.75

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Answers variable, one solution given)

1

65	55	5	5	Hence 5 lbs. of 55 ct.
	70	10+5	15	15 lbs. of 70 ct.
	60	5	5	5 lbs. of 65 ct.

Or any mixture in the ratio of

1 lb. of 55 ct. 1 lb. of 60 ct., and 3 lb. of 70 ct.

2 Three times the quantity of each, observing the ratio 1, 1, 3.

3

$1.00	$1.50	100	100 of wine to 50 water; or, the ratio 2, 1
	$0	50	If 30 gal. wine be used, it would take 15 gal. of water

4 20 gal. × $.64 = 1280. $2260 ÷ 34 = $.66 5/17 per gal.
14 × .70 = 980.
34 $2260.

	35	4	4	These proportions multiplied by 17 give 34 gal. of the 64 and 70 ct. mixtures and fulfill all the conditions of the problem. ∴ One ans. will be 68 gal of 35 ct., 68 gal. of 40 ct., 246 gal. of 50 ct., and 493 gal. of 56 ct.
	40	4	4	
52	50	14 5/17	14 5/17	
	56	17+12	29	
	66 5/17	2	2	

PART IV

POWERS, ROOTS AND MENSURATION

Square Root

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1
$$\begin{array}{r} 10'24(32 \\ 9 \\ \hline 62)\ 124 \\ 124 \\ \hline \end{array}$$

2
$$\begin{array}{r} 33'64(58 \\ 25 \\ \hline 108)\ 864 \\ 864 \\ \hline \end{array}$$

3 640 A. = 102,400 sq. rd.

$$\begin{array}{r} 10'24'00(320 \text{ rd.} \\ 9 \qquad 4 \\ \hline 62)\ 124 \quad 1280 \text{ rds. Ans} \\ 124 \\ \hline 00 \end{array}$$

4 66 ft × 148½ ft = 9801 sq ft.

$$\begin{array}{r} 98'01(99 \text{ ft.} \\ 81 \\ \hline 189)\ 1701 \\ 1701 \\ \hline \end{array}$$

5 3200 sq. rd. × 2 = 1600 sq. rd.

$$\begin{array}{r} 16'00(40 \text{ rd. breadth.} \\ 16 \qquad 2 \\ \hline 80 \text{ rd. length.} \end{array}$$

6
$$\begin{array}{r} 40'96(64 \text{ rd.} \\ 36 \\ \hline 124)\ 496 \\ 496 \\ \hline \end{array}$$

7 12 rds. sq. = 144 sq. rds.
144 sq. rds. − 12 sq. rds. = 132 sq. rds.

$$\begin{array}{r} 12.(3.46 \text{ rd. len'th of S.} \\ 9 \\ \hline 64)\ 300 \\ 256 \\ \hline 686)\ 4400 \\ 4116 \\ \hline 184 \end{array}$$

12 rds. − 3.46 rds. = 8.54.

[Example should read: What is the difference in the length of their sides?]

8 **Metric.** 23×2.47 A. $\times$ $160 = 9089.60$ sq. rds.

$$\begin{array}{r} 90'89.'60 \text{ (95.33 + rd.} \\ 81 \qquad\quad 4 \\ \hline 185) \overline{989} \qquad \overline{381.32} \text{ rd.} \quad \text{A.} \\ 925 \\ \hline 1903) \overline{6460} \\ 5709 \\ \hline 19063) \overline{75100} \\ 57189 \end{array}$$

8 4×160 sq. rd. $= 640$ sq. rd

$$\begin{array}{r} 6'40. \text{ (25.29 + rd.} \\ 4 \qquad\quad 4 \\ \hline 45) \overline{240} \quad \overline{101.16} + \text{rd.} \quad \text{Ans.} \\ 225 \\ \hline 502) \overline{1500} \\ 1004 \\ \hline 5049) \overline{49600} \\ 45441 \end{array}$$

9 $10 \times 160 = 16'00$

$$\begin{array}{r} 16'00 \text{ rd. (40 rd.} \\ \overline{16} \qquad\quad 4 \\ \overline{00} \qquad \overline{160} \text{rd. of fen.} \end{array}$$

1600 sq. rd. $\div 4 = 400$ sq. rd.

$$\begin{array}{r} 4'00 \text{ sq. rd. (20 rd.} \\ \overline{4} \\ \overline{00} \end{array}$$

2 sides 20 rds. $=$ 40 rds.
2 S. 4×20 rds. $= \overline{160}$
$\overline{200}$ rds.

\$2.25 $\times$ $(200 - 160) =$ \$90 in A's favor.

9 **Metric.** $2 \times (387.5$ m. $+$ 174.8 m.$) = 1124.6$ m.

387.5 m. $\times$ 174.8 m. $=$ 67735 sq. m.

$$\begin{array}{r} 6'77'35 \text{ sq. m. (260.2 m. S.} \\ 4 \qquad\quad 4 \\ \hline 46) \overline{277} \qquad \overline{1040.8} \text{ n} \\ 276 \qquad \text{dist. around sq.} \\ \hline 5002) \overline{13500} \\ 10404 \end{array}$$

$(1124.6$ m. $- 1040.8$ m.$) \times$ 1.25 fr. $= 104.75$ fr.

10 72 rd. $\times$ 98 rd. $= 7056$ sq. rd.

$$\begin{array}{r} 70'56 \text{ (84} \\ 64 \\ \hline 164) \overline{656} \\ \overline{656} \end{array}$$

$(72$ rd. $+ 98) \times 2$ rd. $=$ 340 rd.

4×84 rd. $= 336$ rd.

340 rd. : 336 rd. : : \$425 : (\$420.)

11 128 in. $\times$ 32 in. $= 4096$ sq. in.

$$\begin{array}{r} 40'96 \text{ (64} \\ 36 \\ \hline 124) \overline{496} \\ \overline{496} \end{array}$$

CUBE ROOT

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1

```
          261(21
            8
        ------
1200  |  1261
  61  |
   1  |
------ |------
1261   |  1261
```

2 1000 gal. × 231 = 231,000 cubic inches.

```
          231′000 (61.3+
            216
        ------
10800 |  15000
  180 |  10981
    1 |
------ |------
10981  |  4019000
=======

   1116300 |
      1830 |
         9 |
   ------- |
   1118139 |  3354417
           |  664583
```

3 $\sqrt{576} = 24$ in. = 2 ft. on a S. $2^3 = 8$ cu. ft.

4 3750 sq. in. ÷ 6 = 625 area of one face. $\sqrt{625} = 25$ E. $25^3 = 15625$ cu. in. ÷ 231 = 67.64 gal.

5

```
          2′744 (14 in. edge
            1
        ------
 300  |  1744
 120  |
  16  |
------ |------
 436   |  1744
```

$14^2 = 196$ sq. in. × 6 = 1176 sq. in.

6 $\frac{1}{2}$ of $4^3 = 32$.

```
          32 (3.17+ ft.
          27
        ------
2700  |  5000
  90  |
   1  |
------ |------
2791   |  2791
=======|======
288300 |  2209000
  6510 |
    49 |
------ |------
294859 |  2064013
```

7 $1^3 : 2^3 :: 1728$ cu. in. : (13284 cubic inches.

8 4238 kilos. = 4238 cu. dm., ÷ 1000 = 4.238 cu. m.

```
          4.′238 cu. m. (1.6+ m.
            1
        ------
 300  |  3238
 180  |
  36  |
------ |------
 516   |  3096
```

9 225 m. × 14.2 m. × .025 m. = 79.875 cubic m.

TRIANGLES

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1 $10^2+10^2=2'00(14.14$

$$\begin{array}{r} 1 \\ 24)100 \\ 96 \\ 281)400 \\ 281 \\ 2824)11900 \\ 11296 \end{array}$$

2 $20^2-15^2=1'75(13.228$

$$\begin{array}{r} 1 \\ 23)75 \\ 69 \\ 262)600 \\ 500 \\ 2642)7600 \\ 5284 \\ 26448)231600 \\ 217584 \end{array}$$

3 $25^2-18^2=3'01(17.349$

$$\begin{array}{r} 1 \\ 27)201 \\ 189 \\ 343)1200 \\ 1029 \\ 3464)17100 \\ 13856 \\ 34689)324400 \\ 312201 \end{array}$$

4 $40^2+30^2=25'00(50$

$$\begin{array}{r} 25 \\ 00 \end{array}$$

5 $8^2+3^2=73(8.54$

$$\begin{array}{r} 64 \\ 165)900 \\ 825 \\ 1704)7500 \\ 6816 \end{array}$$

6 $22^2+6^2=5'20(22.8$

$$\begin{array}{r} 4 \\ 42)120 \\ 84 \\ 448)3600 \\ 3584 \end{array}$$

7 $22.8+{}^2=520-9^2=4'39$

$$\begin{array}{r} 4'39(20.95 \\ 409)3900 \\ 3681 \\ 4185)21900 \\ 20925 \end{array}$$

8 $60^2+24^2=41'76(64.62$

$$\begin{array}{r} 36 \\ 124)576 \\ 496 \\ 1286)8000 \\ 7716 \\ 12922)28400 \\ 25844 \end{array}$$

9 $250^2-65^2=5'82'75(241.4$

$$\begin{array}{r} 4 \\ 44)182 \\ 176 \\ 481)675 \\ 481 \\ 4824)19400 \\ 19296 \end{array}$$

10 $14^2+14^2=3'92(19.79$

$$\begin{array}{r} 1 \\ 29\overline{)292} \\ 261 \\ \hline 387\overline{)3100} \\ 2709 \\ \hline 949\overline{)39100} \\ 35541 \\ \hline \end{array}$$

$(19.79+14=33.79.$

11 $40^2+30^2+12^2=2644$

$$\begin{array}{r} 26'44(51.419 \\ 25 \\ \hline 101\overline{)144} \\ 101 \\ \hline 1024\overline{)4300} \\ 4096 \\ \hline 10281\overline{)20400} \\ 10281 \\ \hline 102829\overline{)1011900} \\ 925381 \\ \hline \end{array}$$

12 $82^2-36^2=54'28(73.67$

$$\begin{array}{r} 49 \\ 143\overline{)528} \\ 429 \\ \hline 1466\overline{)9900} \\ 8796 \\ \hline 14727\overline{)110400} \\ 103089 \\ \hline \end{array}$$

$73.67+10=83.67$ ft

13 10 A. $\times 160=1600$

16'00(40 rd. on side

$$\begin{array}{r} 16 \\ \hline 00 \end{array}$$

$40^2+40^2=32'00(56.568$

$$\begin{array}{r} 25 \\ 106\overline{)700} \\ 636 \\ \hline 1125\overline{)6400} \\ 5625 \\ \hline 11306\overline{)77500} \\ 67836 \\ \hline 113128\overline{)966400} \\ 905024 \\ \hline \end{array}$$

14 Ans. $=\frac{1}{2}$ length of side.

40 rd. $\div 2=20$ rd.

15 $\sqrt{3729}=9$ length of side.

$9^2+9^2+9^2=243$

$$\begin{array}{r} 243(15.588 \\ 1 \\ \hline 25\overline{)143} \\ 125 \\ \hline 305\overline{)1800} \\ 1525 \\ \hline 3108\overline{)27500} \\ 24864 \\ \hline 31168\overline{)263600} \\ 249344 \\ \hline \end{array}$$

16 $15^2\div 2=112.50$

$$\begin{array}{r} 1'12.'50(10.6+ \text{ rd. side} \\ 206\overline{)1250} \\ 1236 \\ \hline \end{array}$$

$(10.6+)^2=112.50$ rd.

17 $28^2 - 18^2 = 4'60(21.44$

$41)60$
41
$424)1900$
1696
$4284)20400$
16836

$28^2 - 15^2 = 5'59(23.64$

4
$43)159$
129
$466(3000$
2796
$4724)20400$
18896

$23.64 \text{ ft.} + 21.44 \text{ ft.} =$
45.08 ft. Ans.

18 $58^2 + 72^2 = 85'48(92.45$

81
$182)448$
364
$1844)8400$
7376
$18445)102400$
92225

19 $2\frac{1}{2} \text{ ft.} = 30 \text{ in.}$
$1\frac{1}{2} \text{ ft.} = 18 \text{ in.}$
$30^2 + 18^2 + 12^2 = 1368$

$13'68(36.98 \text{ in.}$

9
$66)468$
396
$729)7200$
6561
$7388)63900$
59104

$36.98 \text{ in.} = 3 \text{ ft. } .98 \text{ in.}$

20 Height to eaves 20 ft.
30ft. − 20 ft. = 10 feet
height of roof from eaves

$18^2 + 10^2 = 4'24(20.59$

$405)2400$
2025
$4109)37500$
36981

SURFACES

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1 $20 \text{ rd.} \times 18 \text{ rd.} \div 2 = 180 \text{ sq. rd.}$

2 $(25 \text{ rd.} + 35 \text{ rd.}) \div 2 = 30 \text{ rd.}$ $30 \text{ rd.} \times 13 \text{ rd.} = 390 \text{ sq. rd.}$

3 $11 \text{ rd.} \times 2 \times 3.1416 = 69.1152 \text{ rd.}$ $11^2 \times 3.1416 = 380.1336$

4 (13 ft. × 10 ft.) ÷ 2 = 65 sq. ft. 65 sq. ft. ÷ 3.1416 = 20.690412 = radius². $\sqrt{20.690412} = 4.548$ ft.

5 $40^2 \times 3.1416 = 5026.56$ sq. ft. ÷ $(9 \times 30\frac{1}{4}) = 18.46+$ sq. rd.

6 $3^2 \times .7854 = 70.686$ sq. ft.

7 6 ft. × 5.196 ft. ÷ 2 = 15.588. Area of one triangle, × 6 = 93.528 sq. ft., ÷ 9 = 10.4 sq. yd.

8 135 sq. rd. × 2 = 270 sq. rds. or area of full rectangle, ÷ 18 rd. = 15. rd. side.

9 $72^2 = 5184 \div 2 = 2592$ sq. ft. = square of 1 side = area of square. $\frac{1}{2}$ of 2592 sq. ft. = 1296 sq. ft. Area of triangle.

10 256 sq. ft. ÷ ($\frac{1}{2}$ of 12 ft.) = $42\frac{2}{3}$ ft. = 42 ft. 8 in.

11 (12 in. + 6 in.) ÷ 2 = 9 in. aver. 18 ft. × $\frac{3}{4}$ ft. = $13\frac{1}{2}$ sq. ft.

12 12 ft. 6 in. = 150 in. 150 in. ÷ 3.1416 = 47.746 in.

13 $\sqrt{1} : \sqrt{9} :: 10 : (\ )$; or, $1 : 3 :: 10 : (30)$; $\sqrt{1} : \sqrt{4} :: 10 : (20)$.

14 $20^2 - 5^2 = 375$ ft. (square of radius).
375 ft. × 3.1416 = 1178.10 sq. ft. $20^2 \times 3.1416 = 1256.64$ sq. ft.
1256.64 sq. ft. − 1178.10 sq. ft. = 78.54 sq. ft.

15 1 A. = 160 sq. rd., ÷ .7854 = 203.7108 (sq. of diam.).
$\sqrt{203.7108} = 14.27+$ rd. diam. 14.27 rd. × 3.1416 × $2 = $89.66+

16 (54 rd. × 72 rd.) ÷ 2 = 1944 sq. rd., ÷ 160 = $12\frac{3}{20}$ A.;
$12\frac{3}{20} \times \$125 = \$1518.75$.

17 (108 rd. + 144 rd.) ÷ 2 = 126 rd. aver.
126 rd. × 96 rd. ÷ 160 = 75⅗ A., × $85 = $6426 cost of land.
(108 + 144 + 195.34) rds. = 447.34 rd., × $1.75 = $782.84½ cost of fence. $6426 + 782.845 = $7208.845.

18 (12 ft. + 8 ft.) × 2 ft. × 2 = 80 sq. ft. 2 ft. × 2 ft. × 4 = 16 sq. ft. corners. 80 sq. ft. + 16 sq. ft. = 96 sq. ft.

19 4 ft. × 3.1416 = 12.5664 ft. circum. 5280 ft. ÷ 12.5664 ft. = 420 +

20 31.5 A. × 160 = 5040 sq. rd. (also sq. of one side.)
5040 + 5040 = 10,080. $\sqrt{10080}$ = 100.399 rd. diagonal.
5040 sq. rd. ÷ .7854 = 6417.11 sq. rd. (sq. of diameter.)
$\sqrt{6417.11}$ = 80.10 rd. diam. 80.10 rd. × 3.1416 = 251.6 rd. circum.

SOLIDS

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1 4 × 3 × 2 = 24 cu. ft.

2 4 ft. × 3 ft. × 2 = 24 sq. ft. S. 4 ft. × 2 ft. × 2 = 16 sq. ft. top and bot.
3 ft. × 2 ft. × 2 = 12 sq. ft. ends. (24 + 16 + 12) sq. ft. = 52 sq. ft.

3 5 in. × 3.1416 ÷ 12 = 1.309 ft. cir. 1.309 ft. × 2½ ft. = 3.27½ sq. ft.

4 6 in. × 3.1416 = 18.8496 in. cir. × 8 in. = 150.7968 sq. in. side.
6^2 × .7854 = 28.2744 sq. in. area of bottom.
150.7968 sq. in. + 28.2744 sq. in. = 179.0712 sq. in.

5 Area of base 28.2744 sq. in. × 8 in. = 226.1952 cu. in. ÷ 231 = .979 gal. = 3.91 qt.

6 $12^2 \times .7854 = 113.0976$ sq. in.,
$8^2 \times .7854 = 50.2656$ sq. in. area of bases.
$113.0976 \times 50.2656 = 5683.90$. $\sqrt{5683.90} = 75.38$.
$113.0976 + 50.2656 + 75.38 = 238.74 \times 10 \times \frac{1}{3} = 795.8+$ cu. in.

7 (12 in. + 8 in.) $\div 2 \times 3.1416 = 31.416$ in. av. circum.
31.416 in. $\times 10$ in. $= 314.16$ sq. in.
Area of bottom 50.265 sq. in. + 314.16 sq. in. $= 364.885$ sq. in.,
$\div 144 = 2.53$ sq. ft.

8 1 qt. $= 57\frac{3}{4}$ cu. in. $3^2 \times .7854 = 7.0686$ sq. in. area of bottom.
$57\frac{3}{4} \div 7.0686 = 8.17$ in.

9 $12^2 \times 3.1416 = 452.3904$ sq. in. $= 3.1416$ sq. ft.

10 $1^2 \times .7854 \times 1$ in. $= .7854$ cu. in. $57\frac{3}{4}$ cu. in. $\div .7854 = 73\frac{1}{2}$.

11 $12^2 \times .7854 = 113.0976$ sq. ft. (area of base).
113.0976 sq. ft. $\times 6$ ft. $\times \frac{1}{3} = 226.952$ sq. ft.
226.952 cu. ft. $\times 128 = 1$ cd. 98.952 cu. ft.

12 $12^2 \times .07958 = 11.45952$ area of base
11.45952 sq. ft. $\times 2 \times \frac{1}{3} = 7.63968$ cu. ft.
7.63968 cu. ft. $\times 1728 = 13201.426$ cu. in., $\div 2150.4 = 6.14+$ bu.

13 $12 \div 3.1416 = 3.82$ ft. diam., $\div 2 = 1.91$ ft. radius.
$1.91^2 + 2^2 = 7.6481$. $\sqrt{7.6481} = 2.765$ slant height.
12 (cir.) $\times$ 2.765 (slant H.) $\times \frac{1}{2} = 16.59$ sq. ft. $= 1.844+$ yd.

14 20×231 cu. in. $= 4620$ cu. in.
$18^2 \times .7854 = 254.4696$ area of base.
4620 cu. in. $\div 254.4696$ sq. in. $= 18.16$ in. depth.

15 254.4696 sq. in. (area of base) $\times$ 4 in. $\times \frac{1}{3}$ = 339.2928 cu. in., $\div$ 231 = 1.47 gal.

16 4 $\times$ .5236 = 33.5104 cu. in., $\div 57\frac{3}{4}$ = .58 qt.

17 5 $\times$ 231 cu. in. = 1155 cu. in. $1155 \div 10^2 = 11.55$ in. depth.

18 (12 + 16) $\times$ 10 $\times$ 2 = 560 sq.ft.area of sides, 16 ft. $\times$ 12 ft. = 192 sq. ft. floor. 192 sq. ft. $\div$ .07958 = 2412.6665 circum.^{2} $\sqrt{2412.6665}$ = 49.119 ft. circum., $\times$ 10 = 491.19 + ft. wall. 560 sq. ft. $-$ 491.19 + sq. ft. = 68.80 sq. ft.

19 60 ft. $\times$ 40 ft. $\times$ 20 ft. = 48,000 cu. ft. 60 ft. $\times$ 40 ft. $\times$ 8 ft. $\times \frac{1}{3}$ = 6400 cu. ft. 48,000 cu. ft. + 6400 cu. ft. = 54,400 cu. ft.

20 $14^2 \times .7854 = 153.936$ cu. in. $153.936 \div 144 \times 20 = 21.38$ cu. ft.

21 8000^2 mi. $\times$ 3.1416 = 201,062,400 sq. mi. surface.
201,062,400 sq. mi. $\times$ 8000 mi. $\times \frac{1}{6}$ = 268,083,200,000 cu.in. vol.

22 36 rds. = 594 ft. (28 in. + 18 in.) $\div$ 2 = 23 in. average width 594 ft. $\times$ 4 ft. $\times \frac{2}{12}$ ft. = 4554 cu ft., $\times$ \$.28 = \$1275.12.
More exact solution: 594 ft. $\times \frac{2}{12}$ ft. = 1386 sq. ft.; 594 ft. $\times \frac{1}{12}$ ft. = 891 sq. ft. $1386 \times 891 = 1{,}234{,}926$. $\sqrt{1234926} = 1111.27$ sq. ft., + 1386 sq. ft. + 594 sq. ft. = 3388.27 sq. ft. 3387.27 sq. ft. $\times$ 4 ft. $\times \frac{1}{3}$ = 45176.9$\frac{1}{3}$ cu. ft., (vol. of pyramid) $\times$ \$.28 = \$1264,953.

23 594 ft. $\times (\frac{2}{12} + \frac{4}{12})$ ft. = 1584 sq. ft., $\times \frac{8}{12}$ ft. = 1056 cu. ft., $\times$ \$.32 = \$337.92.

24 3.12 in. $\times$ 3 in. $\times \frac{1}{2}$ = 5.43 sq. in. area of one triangle, $\times$ 8 = 43.44 sq. in. area of base. 43.44 sq. in. $\times$ 120 in. = 5312.8 cu. in., $\div$ 1728 = 3.0745 + cu. ft.

MISCELLANEOUS

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1 $\frac{1}{7}+1\frac{2}{147}+\frac{62}{441}+\frac{10}{441}=\frac{141}{441}$.
$\frac{441}{441}-\frac{141}{441}=\frac{300}{441}=\frac{100}{147}$.
$\$150\div\frac{100}{141}=\$220.50$.

2 $\$1714.275\div\$1.425=\$1203$. $7\times30\times\$2+\$27=\$447$.
$\$1203-\$447=\$756,\div210=\$3.60$.

3 Amt. of $1 at C. Int. for five years $=\$1.343916$.
$\$5000\div\$1.343916=\$3720.47$.

4 $800\times\$4.75=\$3800,\times.01\frac{3}{4}=\$66.50$ com.
$\$3800.-\$66.50=\$3733.50,\div1.02=\$3660.29\div.06\frac{1}{2}=56312$ lb.
$\$3733.50-3660.29=\$73.21$ com. $\$66.50+\$73.21=\$139.71$

5 $4\frac{1}{2}$ A. $\times160=720$ sq. rds $\div(9\times5)=16$ sq. rd. $\sqrt{16}=4$.
4 rd. $\times5=20$ width. 4 rd. $\times9=36$ rd. length.
$(20$ rd. $+36$ rd.$)\times2=112$ rd. $\times16\frac{1}{2}=1848$ ft. dist. around field.
1848 ft. $\div8$ ft. $=231$ number of posts required
1848 ft. $\times8\frac{1}{2}$ ft. $=$ 15,708 ft. close boards.
1848 ft. $\times2\times4\div12\times2=$ 2404 ft. scantling
231 ft. $\times8\times5\times5\div12=$ 3850 ft. posts.
32.022 M.

$\$440.44\div22.022=\$20$.

6 327.46 ares $\div3=109.15\frac{1}{3}$ ares $\times100=10915\frac{1}{3}$ sq. mi.
$\sqrt{10915\frac{1}{3}}=104.48-$ m. wide. $104.48\times3=313.4+$ m. long.

7 $9\frac{1}{10}+7\frac{1}{8}$ $16\frac{9}{40},\div7\frac{7}{8}\times41\frac{9}{11}=\frac{649}{40}\times\frac{8}{63}\times\frac{460}{11}=86\frac{10}{63}$.

8 17 ft. 204 in. $\div39.37=5.1816$ m. 13 ft. 2 in., $=158$ in. $=$
4.0132 m. 5.1816 m. $\times$ 4.0132 m. $=20.791$ sq. m. $\times.85=\$17.67$

9 5.13875 mi. × 320 + 25.312 rd. = 1669.712 rd, × $5\frac{1}{2}$ = 9183.416 yd. − 147.3125 yd. = 9036.1035 ft., × 3 = 27,108.31 ft.

10 124^2 = 153.76 sq. m. × $3\frac{1}{7}$ = 483 sq. m. ÷ 100 = 4.83 ares.

11 36 A. × 160 = 5760 sq. rd. ÷ (9 × 10) = 64 sq. rd. $\sqrt{64}$ = 8.
8 × 9 = 72 rds. width. 8 × 10 = 80 rds. length.
72 rds. (1188 ft.) × 60 ft. × 2 = 142,560 sq. ft. for 2 streets.
80 rds. (1320 ft) × 80 ft. × 3 = 316,800 sq. ft. for 3 streets.
142560 sq. ft. + 316,800 sq. ft. = 459,360 sq. ft. for streets
36 A. × 43,560 sq. ft. = 1,568,160 sq. ft. − 459,360 sq. ft. = 1,108,800 sq. ft.

12 36 A. × $500 = $18,000 + $800 = $18,800. $42,240 − $18,800 = $23,440 gain. $23,440 ÷ $18,800 = $124\frac{4}{47}\%$.

13 $220 \times 1.08\frac{3}{4}$ = $239.25. $500 − $239.25 = $260.75 ÷ $239.25 = 109%.

14 278.54 ares × 100 = 27,854 sq. m. ÷ .7854 = 35,464.73 sq. m. $\sqrt{35,464.73}$ = 188.32 m.

15 $\frac{1}{8}$ of 8% = $2\frac{2}{3}\%$; $\frac{1}{4}$ of 12% = 3%; $\frac{1}{5}$ of 16% = $3\frac{1}{5}\%$; $\frac{1}{10}$ of 20% = $4\frac{1}{3}\%$
15% − ($2\frac{2}{3}\%$ + 3% + $3\frac{1}{5}\%$ + $4\frac{1}{3}\%$ = $13\frac{1}{5}\%$) = $1\frac{4}{5}\%$.
$54 ÷ .01$\frac{4}{5}$ = $3000. $3000 ÷ 3000 = $1 per cental.

16 $1.00 − .01$\frac{4}{5}$ = .98$\frac{4}{5}$. $.98$\frac{4}{5}$ ÷ 1.025 = .96 invested from each dollar. 1.00 − .96 = .04 com. $241.40 ÷ .04 = $6035.
$6035 × .96 = $5793.60 cotton investment.

17 $1 of note cost me $.66$\frac{2}{3}$ × 1.25 = $.83$\frac{1}{3}$, × .95 = $.79$\frac{1}{6}$ proceeds. $.79$\frac{1}{6}$ proceeds − $.66$\frac{2}{3}$ cost = $.12$\frac{1}{2}$ gain. $75 × .12$\frac{1}{2}$ = $600 face of note.

18 $\left.\begin{matrix} 8 \text{ hr.} : 10 \text{ hr.} \\ 40 \text{ da.} : 60 \text{ da.} \\ 1 \quad : \quad 2 \end{matrix}\right\} : : 4 \text{ men}; (15 \text{ men}).$

19 $5\frac{1}{2}$ rd. $\times 5\frac{1}{2}$ rd. $= 30\frac{1}{4}$ sq. rd.

20 34.28 ares $\times 100 = 3428$ sq. m. $\div (\frac{1}{2}$ of 39.4 m.$) = 174.01$ m.

21 1 mi. sq. $= 640$ A. $\div 2.47$ A. $= 259.11 +$ ares.

22 \$3600 $\times 1.30 =$ \$4680 marked price. $.90 \times .95 = .855$.
\$4680 $\times .855 =$ \$4001.40.

23 \$1 + .01 premium = \$1.01 − .01 interest = \$1.00.
502.25 $\times$ \$1 = \$502.25.

24 $\frac{2}{3} - \frac{1}{10} = \frac{17}{30}$; $3 + \frac{2}{5} = 3\frac{2}{5}$; $1\frac{1}{2} + \frac{5}{7} = 3\frac{1}{14}$; $3 - 1\frac{2}{3} = 1\frac{1}{3} \times 5 = \frac{20}{3}$.
$\frac{17}{30} \times \frac{17}{5} = \frac{289}{150}$; $3\frac{1}{14} + \frac{20}{3} = \frac{374}{42}$; $\frac{289}{150} \div \frac{373}{42} = .2169 +$.

25 $7 + 11 = 18$. A's share $= \frac{7}{18}$ of 540 A. $= 210$ A. B's share $= \frac{11}{18}$ of 540 A. $= 330$ A.

26 (3.64 m.)$^2 \times 3.1416 = 41.62494336$ sq. m. surface.
$3.64^3 = 48.3287 +$ cu. m. $\times .5236 = 25.3049$ cu. m.

27 \$80 $\div$ \$1.75 = \$140 amount he would have received.
\$140 − 80 = \$60 amt. loss $\div$ (\$1.75 + \$.75 daily loss) = 24 days loss. 80 da. − 24 da. = 56 working days.

28 $\frac{3}{4}$ A. $= \frac{2}{3}$ B. $\frac{1}{4}$ A's $= \frac{2}{3}$ B's $\div \frac{3}{4} = \frac{8}{9}$ B's. $\frac{9}{9}$ B's $+ \frac{8}{9}$ B's $= \frac{17}{9}$ B's $= 136$ yrs. $\frac{1}{9}$ B's $= 136 \div 17 = 8$. A's $= 8 \times 8$ yrs. $= 64$ yrs.
s $= 8 \times 9$ yrs. $= 72$ yrs.

29 $2.8^2 \times .7854 = 6.1575 +$ sq. m. area of base, $\times 3.8 = 23.3985$ cu. m. $\times 1000 = 23{,}398.5$ litres or kg.

30 $\frac{1}{3}$ of quantity = 56 A. 18 sq. rd., + 4 A. 126 sq. rd. = 60 A. 144 sq. rd. A's share.
Quantity − A's share = 388 A., × $\frac{1}{3}$ = 77 A. 96 sq.rds. B's share.
388 A. − B's share = 310 A. 64 sq. rd. × $\frac{1}{3}$ = 103 A. 74$\frac{2}{3}$ sq. rd. C's share.
310 A. 64 sq. rd. − C's share = 206 A. 149$\frac{1}{3}$ sq. rd. D's share.

31 Dist. around = 5 rds. × 4 = 330 ft. (length) × 3 ft. (width) + 3 ft. × 3 ft. × 4 (corners) = 1026 sq. ft.
Vol. of earth = 5 rds. × 5 rds. × 6 in. = 3403$\frac{1}{3}$ cu. ft.
3003$\frac{1}{3}$ cu. ft. ÷ 1026 sq. ft. = 3.3168 + ft. deep.

32 43.6 m. × 27.9 m. × .16 m. = 194.6304 cu. m. × 1000 = 194,630.4 kilograms.

33 $10^2 \times .7854 \times 10 = 785.4$ cu. ft. × 1728 = 1,357,171.2 cu. in., ÷ (63 × 231 cu. in. = 14,553 cu. in.) = 93.257 hogshead.

34 £1 = $4.866, ÷ 20 = $.243 value of shilling.
$1 ÷ $.243 = 4 s. 1.38 d. value $1.
1 fr. = $.186. $1 ÷ $.186 = 5.376 fr. value $1.

35 58.248 cu. m. ÷ (3.7 m. × 3.42 m. = 12.654 sq. m.) = 4.6 + m.

36 550 × $1.80 = $990, × 1.02$\frac{1}{2}$ = $1012.275, + $17 = 1029.275, × 1.00$\frac{1}{4}$ = $1031.848 + .

37 $750 = $\frac{5}{4}$ prin. Prin. = $600. Int. $150. Int. on $600 3 yrs. @ 1% = $18. $150 ÷ $18 = 8$\frac{1}{3}$, × 1% = 8$\frac{1}{3}$%.

38 32.5 m. × 3.2 m. × 1.8 m. = 187.2 cu. m., or steres.

39 $3\frac{1}{2}$ days + $14\frac{1}{2}$ days = 18 days. \$53 ÷ 18 = \$2.94$\frac{4}{9}$ per day.
$3\frac{1}{2} \times \$294\frac{4}{9} = \$10.3055$ share of one.
$14\frac{1}{2} \times \$294\frac{4}{9} = 42.69\frac{4}{9}$ share of other.

40 $\frac{1}{5}$ of \$5400 = \$1800 C's share. 8000 + 10,000 = 18,000.
A's share = $\frac{8}{18}$. B's share = $\frac{10}{18}$.
\$5400 − \$1800 = \$3600. $\frac{8}{18}$ or $\frac{4}{9}$ of \$3600 = \$1600 A's share.
$\frac{10}{18}$ or $\frac{5}{9}$ of \$3600 = \$2000 B's share.

41 52 men : 45 men
45 ft. : 60 ft.
10 ft. : 8 ft.
15 da. : 25 da.
} :: 355 ft. : ($546\frac{2}{13}$ ft.)

42 \$3.50 C. × 1.20 = \$4.20 S. P., ÷ .80 = 5.25 A. P.

43 $8\frac{4}{5}$ cd. × \$7.20 = \$63.36 ÷ (.20 + .12) = 198 lbs. of each.

44 2.28 m. × $3\frac{1}{7}$ = $7.16\frac{4}{7}$ m. circum.
3.8^2 m. + 1.14^2 m. = 3.96 m. slant heighth.
3.96 m. × $7.16\frac{4}{7}$ m. × $\frac{1}{2}$ = 14.1877 sq. m. surface of sides
$2.28^2 \times .7854 = 4.0828$ sq. m. area of base.
14.1877 sq. m. + 4.0828 sq. m. = 18.27 sq. m.

45 729 = 3, 3, 3, 3, 3, 3. 336 = 2, 2, 2, 2, 3, 7. 1836 = 2, 2, 3, 3, 3, 17.

46 \$2675 − \$2225 = \$450. 180 sheep : 1500 sheep :: \$450 : (\$3750).

47 336(84 G. C. F. 336(4
420(84 G. C. F. 420(5
504(84 G. C. F. 504(6

48 32.5 m. × 32.5 m. × 1.8 = 187.2 steres, ÷ .276 cd. = 51.66 cd.
.66 cd. × 188 = 83.48 cu. ft.

49 $\$60 \times \frac{6}{5} \times \frac{3}{4} = \$54.$

50 $\frac{5}{8}$ of 420 gal. $= 262\frac{1}{2}$ gal. $+ 87\frac{1}{2}$ gal. $= 350$ gal. $350 \div 420 = \frac{5}{6}$.

51 24 T. 4 cwt. 1 qt. 18 lb. $= 54{,}254$ lb. $\times 3$ d. $= 162{,}762$ d. $\times .020\frac{1}{4} = \$3295.93$ cost. $54{,}254$ lbs. $= 24\frac{4453}{2000}$ S. T. $\times \$142 = \$3852.03$ S. P., $- 3295.93$ C. $= \$556.10$ G.

52 38.18 m. $\times$ 73.3 m. $\times .003$ m. $= 8.395782$ cu. m. $= 8395.782$ kilograms.

53 Diff. in time $=$ 6 mo. 17 da. Int. on \$1 for given time $\$.065\frac{2}{3}$. $\$714.50 \times 1.065\frac{2}{3} = \$761.418$.

54 $\$534 \times 1.04 = 555.36$ amt. of note. Discounted time from Mar. 17 till June $4 = 2$ mo. 17 da. $\$555.36 \times .021\frac{7}{18} = \$11.879$ discount. $\$555.36 - \$11.879 = 543.441$ proceeds.

55 At one o'clock hour hand is 5 minute spaces ahead of minute hand, and will be overtaken by minute hand in $\frac{1}{11}$ of 5 minutes, or $\frac{5}{11}$ min. Hence, Ans. $5\frac{5}{11}$, min. past one.

56 $\frac{1}{13}$ of 60 min. $= 4\frac{8}{13}$ min. Hence at $55\frac{5}{13}$ minutes past twelve, or at $4\frac{8}{13}$ minutes to one o'clock.

57 The principal due each year will be the present worth of the principal for the preceeding year.

1.10)\$1.00		1st. P. W.
1.10) .90909		2nd. "
1.10) .82644		3rd. "
1.10) .7513		4th. "
1.10) .683		5th. "
\$4.1697		total P. W.

$\$5000 \div \$4.1697 = \$1199.08$ amt. of each payment.

APPENDIX

ANSWERS TO PRIMARY NUMBER LESSONS

NOTE.—Very few of the examples in the Primary Number Lessons are numbered in consecutive order, nevertheless the careful teacher can easily place the answers as found in this Appendix.

12
Page 19

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Page 20

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31 Page 37

1 2 1 9 1 6 6 8 9 8 6 5 3 3

32 Page 38

8 7 3 4 4 8 7 5 0 2 5 7 8 7

34 Page 40

2 3 4 4 9 6 3 8 4 2 1 4 5 7 2 8 4 3 9

35 Page 41

6 5 6 3 3 9 2 1 5 7 8 7 5 2 9 4

36 Page 41

3 6 7 7 6 3 (p. 42) 1 5 4 3 6 2 8 7

37 Page 42

9 4 10 3 9 9 2 1 2 4 9 4 3 1 3 1

38 Page 43

4 3 4

9 2 3 3 1 3 8 1 9 2 5 1 8

39 Page 44

2 9 5 2 4 5 9 7 3 3 9 8 6 4 5 2 8

40 Page 45

3 5 10 1 10 5

2 10 1 6

42 Page 48

4 7 5 6 8 10 1 7 3 2 9 4 6 4 1 7

43 Page 49

4 1 1 5 1 8 7 3 9 1 2 1 6 10 8 5

44 Page 50

5 3 1 2 3 2 2 5 3 4 8 1 2 6 2

45 Page 51

5 6 10 4 5 2 1 6 2 5 6 3 4 7 3 3

46 Page 52

7 3 2

6 2 2 6 6 3 2 3 8 2 4 9 3 5 4

48 Page 55

4 8 3 3 9 4 7 9 8 2 1 6

49 Page 55

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3 5 2 2 3 10 3 8 4

50 Page 56

2 3 2 4 6 10 5 3 2 2 5 3 2 3 2 4 2 2

51 Page 57

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52 Page 58

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53 Page 59

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Col's
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Col's
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Col's
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Page 117

$1.68
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$6.76
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980
(p. 118)
$1940
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142-1
90-5
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76-1
92
61-2
16-5
71-4
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43-1
279-1
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62-2
36-2
47-1
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82-5
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45-2
87-9
36-4
86-3
85-1
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358
83-3
94-3
57-6
79-1
52-5
53
48-8
47-2
23-6
39-1
58-1
76-3
62-1

96
Page 119

$4375
25 doz.
15 p'ncil
(p. 120)
150 yds.

$825
52 hrs.
21 bbl.
126
197-3
11172
6889
1836
366-3
2472
761—2

98
Page 122

$849\frac{1}{2}$
$237\frac{7}{4}$
$932\frac{3}{5}$
$243\frac{5}{6}$
(p. 123)
582
$395\frac{3}{4}$
$973\frac{1}{3}$
$753\frac{8}{11}$
$493\frac{7}{10}$
489
$647\frac{1}{3}$
$485\frac{4}{7}$

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Page 123

1—10
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8—10
9— 6
10— 7
11— 5
12— 6
(p. 124)
13— 3
47,801

216,909
62,444
92,542
26,662

Review
Page 124

1—46
2—1 ct.
3—54
4— 9
5— 6
6— 5
7—27
8—56
9— 5
10— 8
11—28
12 {20 c. / 25 c.
13—$24
14—$6
15—9 y's

100
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1—28
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9—54
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7—24
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1— 1
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3— 5
4—96
5—W
6—10
7— 8
8—75
9—10
10—195
27,189
69,247
62,048
87,720

105
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Last Set
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6—15
7—48
8— 8
9—60
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1st Col.
36
96
35
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2nd Col.
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3rd. Col.
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63
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136

1—20
2—56
3—25
4—30
5—25
6—18
7— 8
8—60,000
9—42
10—95
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111
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137

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112
Page
138

1—$2\frac{2}{5}$
2—$1\frac{5}{7}$
3—$1\frac{1}{9}$
4—$1\frac{1}{4}$
5— $\frac{3}{4}$
6—$4\frac{2}{3}$
7—$1\frac{1}{9}$
8—$5\frac{5}{8}$
9—$2\frac{1}{4}$
10—$4\frac{1}{2}$
$4\frac{4}{5}$
$1\frac{1}{11}$
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$3\frac{3}{7}$
$5\frac{1}{4}$
$4\frac{2}{7}$
$4\frac{4}{9}$
$7\frac{4}{11}$

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Page
139

1—$\frac{4}{11}$
2—$\frac{3}{4}$
3—$\frac{2}{5}$
4—$\frac{2}{3}$
5—20 cts.
6—$\frac{3}{14}$
7—$\frac{2}{9}$
8—$\frac{2}{11}$
9—$1\frac{1}{4}$
10—$\frac{4}{9}$

2nd. Col.
$1\frac{2}{15}$
$1\frac{1}{7}$
$1\frac{6}{17}$

3rd Col.

Rev. Page 141
1—9 feet.
2—36
3—28
4—$1
5—2
6—32
7—7
8—35
9—4
10—9
11—604,192
12—290,796
13—26,232
14—5934$\frac{4}{9}$
15—76
16—11
17—2 cts. 16 cts.
18—8.
19—21
20—6
21—7
22—24
23—7
24—48
25—9
26—$6\frac{3}{5}$
27—20 cts
28—7.
29—49
30—$\frac{4}{9}$
31—43
32—5006
33— { 24,690 / 10,972
34—46,717
35—25,326
36—72
37—8
38—8
39—7
40—14
41—4
42—12
43—5
44—9
45—21
46—12
47—$\frac{2}{7}$
48—$1\frac{7}{11}$
49—7
50— 3
51—18,564
52—8372½

53—159,637
54— 78,272 / 4,936
55— 334,825 / 242,779
56—16
57— $\frac{63}{5}$, $\frac{32}{5}$, $\frac{46}{5}$
58—48 cts.
59—5 days
60—88
61—12
62—8
63—12
64—8
65—36
66—1
67—3579$\frac{2}{3}$
68— 65,791 / 129,070 / 74,976
69—18$\frac{3}{7}$
70—33
71—14
72—11
73—32
74—2$\frac{3}{8}$
75— 31,884 / 91,877 / 21,816
76— 29,259 / 101,940 / 87,199
77— $\frac{67}{7}$
78—16
79—24
80—40 cts.
81— 9,631$\frac{5}{8}$ / 2,486$\frac{6}{7}$ / 12,435$\frac{3}{10}$
82—6000
83—99,534
84—5
85—8
86—54
87—15, 27
88—5$\frac{2}{4}$
89—17
90—134
91—$\frac{2}{5}$
92—30
93—6$\frac{2}{3}$
94—53$\frac{1}{2}$
95—30
96—7
97—5
98—2
99—30
100—6
101— 23,456$\frac{4}{5}$ / 54,321 / 7,392$\frac{6}{11}$ / 12,468$\frac{1}{2}$
102— 690,760 / 34,150
103— 351,845 / 27,158 / 481,382
104—653,584
105—18
106—10 cds.
107—54
108—1
109—12
110— $\frac{3}{10}$
111—60
112—54
113—4
114—10
115—24
116—11
117—67
118—5 cts.
119—45
120—$4.80
121— 58$\frac{1}{6}$ / 15$\frac{6}{7}$ / 48$\frac{7}{9}$
122—21
123— 468,305 / 34,619 / 54,185
24— 55,926 / 33,741 / 449,184
125— 31,246$\frac{2}{3}$ / 28,754$\frac{4}{4}$ / 16,827$\frac{5}{9}$
126—29,285
127— 5,720
128—12 cts.
129—24 cts.
130—117 sq. ft
131—4 days
132—5 hrs.
133—11
134—11
135—114
136—7
137—30
138— 7,891$\frac{2}{5}$ / 19,465 / 15,864$\frac{7}{11}$
139—9
140—19$\frac{1}{3}$
141—4$\frac{5}{7}$
142—57
143—9
144— 7,293$\frac{1}{3}$ / 13,597$\frac{4}{7}$
145— 183,750 / 58,583 / 195,276
126— 982 / 236,407
147— 6,879$\frac{2}{5}$ / 9,837$\frac{11}{12}$
148—2
149—$6
150— $\frac{46}{6}$, $\frac{72}{9}$
151—6 p'nc'ls 2c
152—$48
153—$.71$\frac{3}{7}$
154—84
155—1$\frac{3}{7}$
156—6
157—4
158—5
159—14$\frac{12}{17}$
160—15
161—6$\frac{5}{12}$